TECHNICAL REPORT

卓時檢測 TIMEWAY TESTING LABORATORY

ISO/IEC17025Accredited Lab.

Report No:	FCC 1006393-02
File reference No:	2010-08-02
Applicant:	Shenzhen Sinchun Electronic Co., Ltd
Product:	NOTE BOOK
Model No:	M5A
Trademark:	saycool
Test Standards:	FCC Part 15 Subpart C, Paragraph 15.247
Test result:	It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.247 regulations and RSS-210 for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung
Manager

Dated: Aug 02, 2010

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Tel (755) 83448688 Fax (755) 83442996

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.:899988.

IC- Registration No.: IC5205A-01

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205A-01.

Test Report Conclusion

Content

1.0	**General Details**	4
1.1	Test Lab Details	4
1.2	Applicant Details	4
1.3	Description of EUT	4
1.4	Submitted Sample	4
1.5	Test Duration	4
1.6	Test Uncertainty	4
1.7	Test By	5
2.0	**List of Measurement Equipment**	5
3.0	**Technical Details**	7
3.1	Summary of Test Results	7
3.2	Test Standards	7
4.0	EUT Modification	7
5.0	Power Line Conducted Emission Test	8
5.1	Schematics of the Test	8
5.2	Test Method and Test Procedure	8
5.3	Configuration of the EUT	8
5.4	EUT Operating Condition	9
5.5	Conducted Emission Limit	9
5.6	Test Result	9
6.0	**Radiated Emission test**	14
6.1	Test Method and Test Procedure	14
6.2	Configuration of the EUT	14
6.3	EUT Operation Condition	14
6.4	Radiated Emission Limit	15
7.0	20dB Bandwidth Measurement	30
8.0	Maximum Peak Output Power	34
9.0	Carrier Frequency Separation	36
10.0	Number of Hopping Channel	38
11.0	Time of Occupancy (Dwell Time)	41
12.0	Out of Band Measurement	48
13.0	Antenna Requirement	51
14.0	Maximum Permissible Exposure	52
15.0	FCC Label	53
16.0	Photo of Test Setup and EUT View	54

1.0 **General Details**

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Telephone: (755) 83448688

Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-01

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: Shenzhen Sinchun Electronic Co., Ltd

Address: Shenzhen Sinchun Electronic Co., Ltd/3/F,Unit5,Cuihai Industrial Zone,Fengtang Road,Fuyong Town,Baoan District,Shenzhen, China

Telephone: 755 83957777

Fax: 755 83956777

1.3 Description of EUT

Product:	NOTE BOOK
Manufacturer:	Shenzhen Sinchun Electronic Co., Ltd
Brand Name:	saycool
Model Number:	M5A
Additional Model Name	N/A
Additional Trade Name	N/A
Rating:	Input: 100-240V~1.0A 60/50Hz
Power Supply	Model: XKD-C20001C 12.0-24W Input: 100-240V~1.0A 60/50Hz Output: 12V-2A
Type of Modulation	FHSS
Frequency range	2402-2480MHz
Number of Channel	79
Frequency Selection	By software
Antenna type	ceramic chip antenna, the antenna gain is 5.5dBi maximum

1.4 Submitted Sample: 2 Sample

1.5 Test Duration

2010-06-30-2010-08-02

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB
Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

The sample tested by Terry Tang

Print Name: Terry Tang

6.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2009-12-05	2010-12-04
Absorbing Clamp	ROHDE&SCHWARZ	MDS-21	100126	2009-12-05	2010-12-04
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2009-12-05	2010-12-04
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2009-12-05	2010-12-04
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2009-12-05	2010-12-04
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2010-03-29	2011-03-28
4-WIRE ISN	ROHDE&SCHWARZ	ENY 41	830663/044	2010-02-17	2011-02-16
GG ENY22 Double 2-Wire ISN	ROHDE&SCHWARZ	ENY22	83066/016	2010-02-17	2011-02-16
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2010-02-17	2011-02-16
System Controller	CT	SC100	-	2010-02-17	2011-02-16
Printer	EPSON	PHOTO EX3	CFNH234850	2010-02-17	2011-02-16
FM-AM Signal Generator	JUNGJIN	SG-150M	389911177	2010-02-17	2011-02-16
Color TV Pattern Generator	PHILIPS	PM5418	LO621747	2010-02-17	2011-02-16
Computer	IBM	8434	1S8434KCE99 BLXLO*	-	-
Oscillator	KENWOOD	AG-203D	3070002	2010-02-17	2011-02-16
Spectrum Analyzer	HAMEG	HM5012	-	-	-
Power Supply	LW	APS1502	-	-	-

5K VA AC Power Source	California Instruments	5001iX	56060	2010-02-17	2011-02-16
CDN	EM TEST	CDN M2/M3	-	2010-02-17	2011-02-16
Attenuation	EM TEST	ATT6/75	-	2010-02-17	2011-02-16
Resistance	EM TEST	R100	-	2010-02-17	2011-02-16
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2010-02-17	2011-02-16
Inductive Components	EM TEST	MC2630	-	2010-02-17	2011-02-16
Antenna	EM TEST	MS100	-	2010-02-17	2011-02-16
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2010-02-17	2011-02-16
Power Amplifier	AR	150W1000	300999	2010-02-17	2011-02-16
Field probe	Holaday	HI-6005	105152	2010-02-17	2011-02-16
Bilog Antenna	Chase	CBL6111C	2576	2010-02-17	2011-02-16
Loop Antenna	EMCO	6502	00042960	2010-02-17	2011-02-16
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2010-02-17	2011-02-16
3m OATS	--	--	N/A	2010-02-17	2011-02-16
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2009-08-15	2010-08-14
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2010-07-03	2011-07-02
Power meter	Anritsu	ML2487A	6K00003613	2010-02-17	2011-02-16
Power sensor	Anritsu	MA2491A	32263	2010-02-17	2011-02-16
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2010-05-14	2011-05-13
LISN	AFJ	LS16C	10010947251	2010-5-14	2011-05-13
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2010-5-14	2011-05-13
9*6*6 Anechoic	--	--	N/A	2010-5-14	2011-05-13

3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Requirement	CFR 47 Section	Result	Notes
Antenna Requirement	15.203, 15.247(b)(4)	PASS	Complies
Maximum Peak Out Power	15.247 (b)(1), (4)	PASS	Complies
Carrier Frequency Separation	15.247(a)(1)	PASS	Complies
20dB Channel Bandwidth	15.247 (a)(1)	PASS	Complies
Number of Hopping Channels	15.247(a)(iii), 15.247(b)(1)	PASS	Complies
Time of Occupancy (Dwell Time)	15.247(a)(iii)	PASS	Complies
Spurious Emission, Band Edge, and Restricted bands	15.247(d),15.205(a), 15.209 (a),15.109	PASS	Complies
Peak Power Spectral Density	15.247(e)	PASS	Complies
Conducted Emissions	15.207(a)，15.107	PASS	Complies
RF Exposure	15.247(i), 1.1307(b)(1)	PASS	Complies

3.2 Test Standards

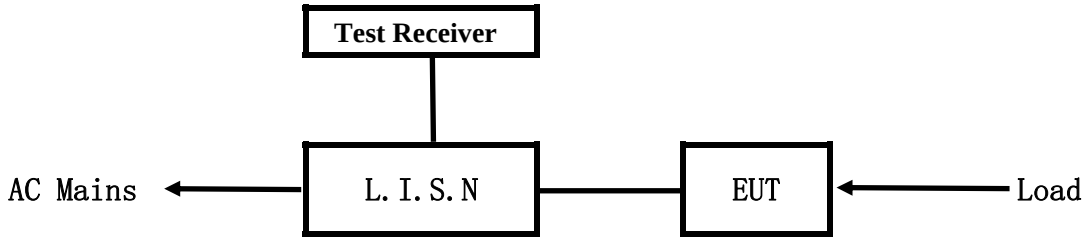
FCC Part 15 Subpart & Subpart C, Paragraph 15.247

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co.,Ltd

5. Power Line Conducted Emission Test

5.1 Schematics of the test



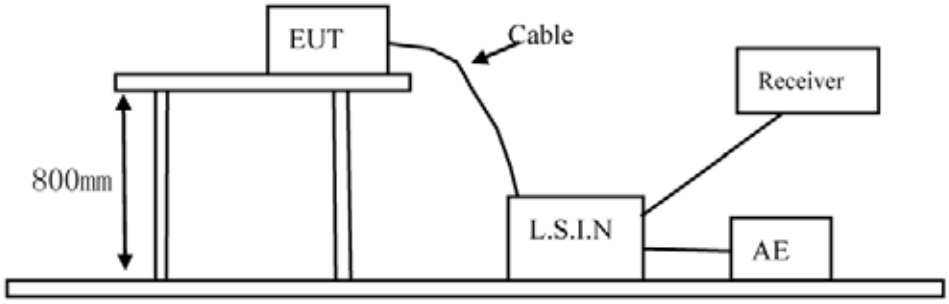
EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID
NOTE BOOK	Shenzhen Sinchun Electronic Co., Ltd	M5A	YG6M5A

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.107 ,15.207and RSS-210

Frequency (MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ～ 0.50	79.0	66.0	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	73.0	60.0	56.0	46.0
5.00 ～ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

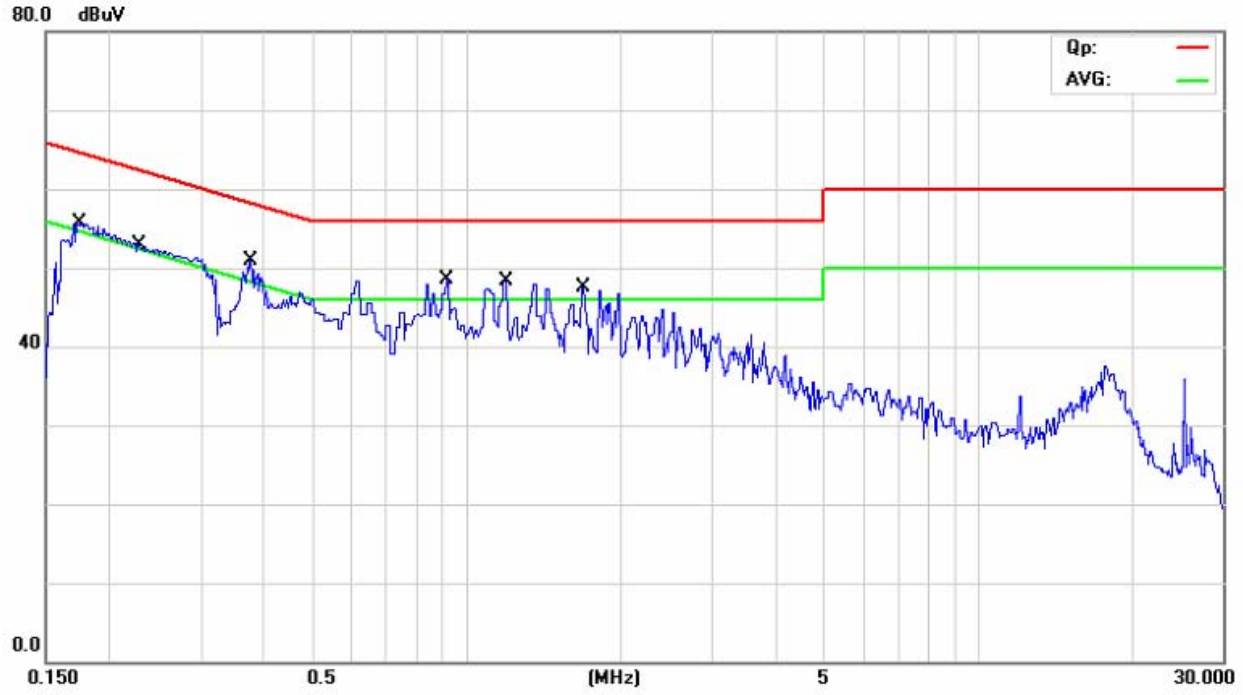
Note: the worse cases was selected to conducted the test

A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Read USB,TF card and Running EMC test software and Ping wireless network

Results: **Pass**

Please refer to following diagram for individual



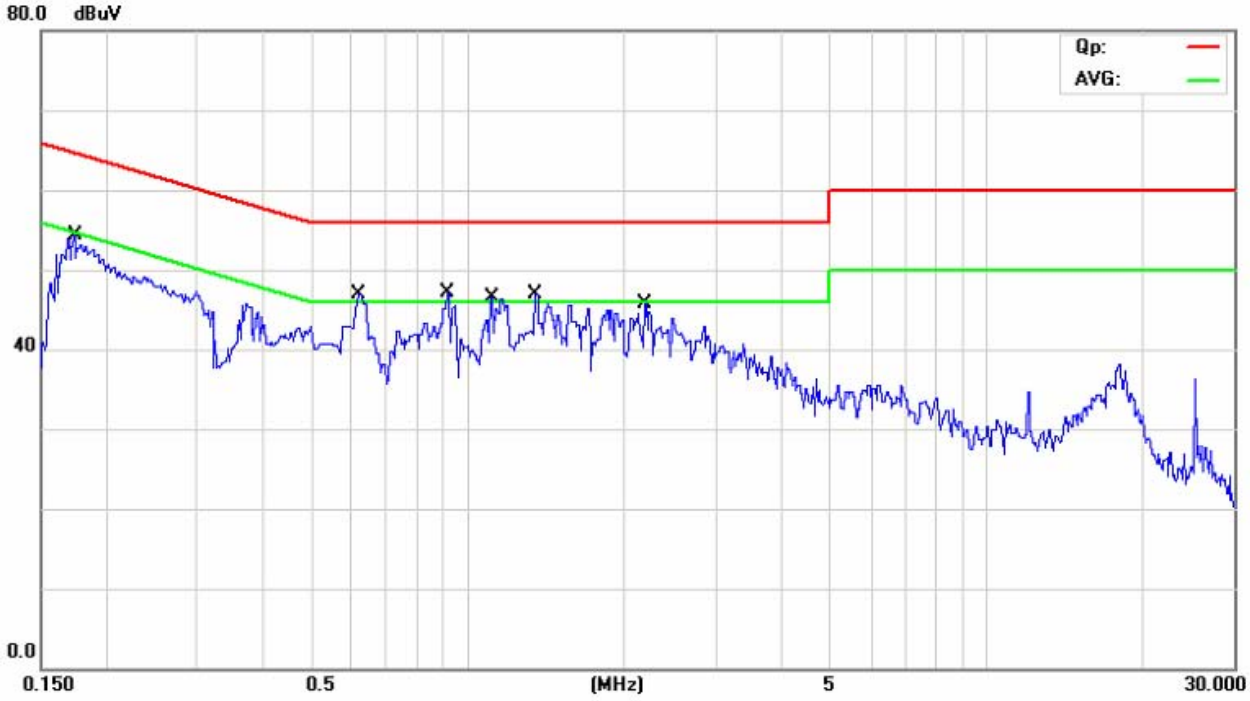
Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Line		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1753	54.35	45.57	--	--	64.71	54.71
0.2278	51.29	42.91	--	--	62.53	52.53
0.3756	49.89	40.82	--	--	58.38	48.38
0.9162	47.47	40.04	--	--	56.00	46.00
1.1861	47.21	38.09	--	--	56.00	46.00
1.6812	46.33	37.42	--	--	56.00	46.00

B **Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)**

EUT set Condition: Read USB, TF card and Running EMC test software and Ping wireless network

Results: **Pass**

Please refer to following diagram for individual



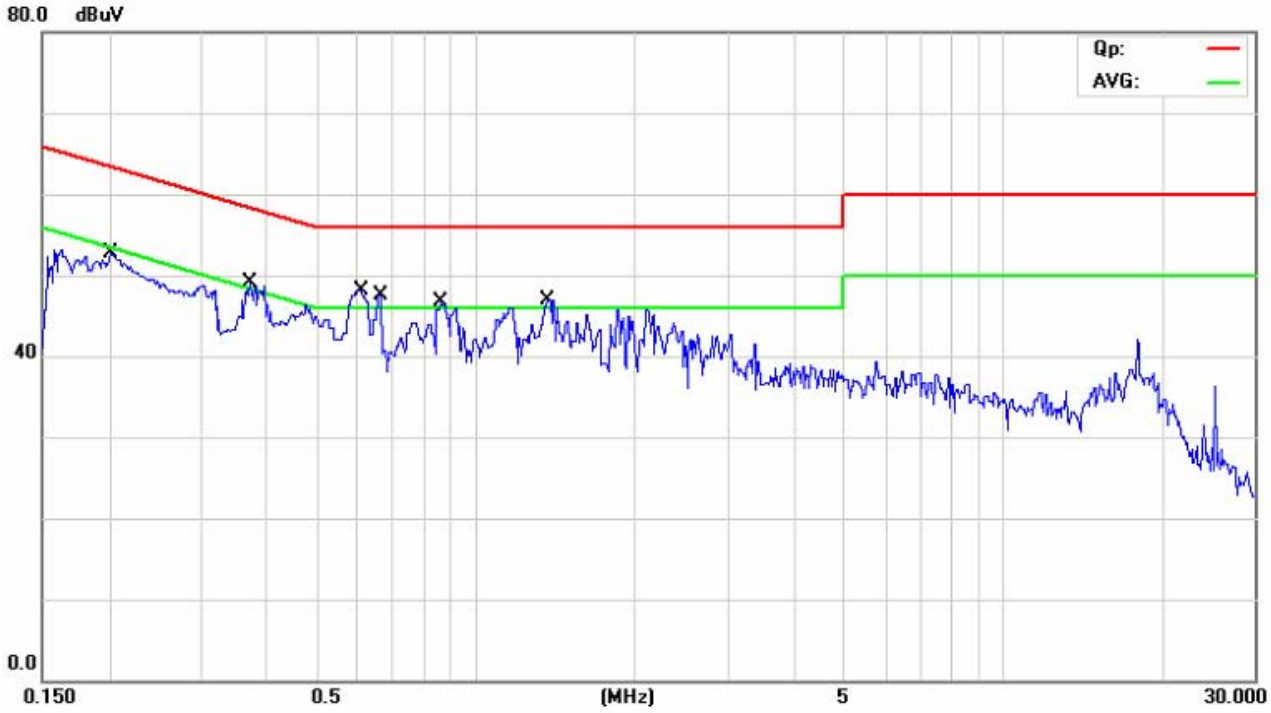
Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1736	--	--	53.25	46.39	64.79	54.79
0.6237	--	--	45.99	40.02	56.00	46.00
0.9162	--	--	46.23	38.65	56.00	46.00
1.1072	--	--	46.74	39.46	56.00	46.00
1.3550	--	--	45.97	37.06	56.00	46.00
2.1987	--	--	44.83	38.61	56.00	46.00

C Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Running notebook test program , Ping network and Keep Bluetooth Transmitting

Results: **Pass**

Please refer to following diagram for individual



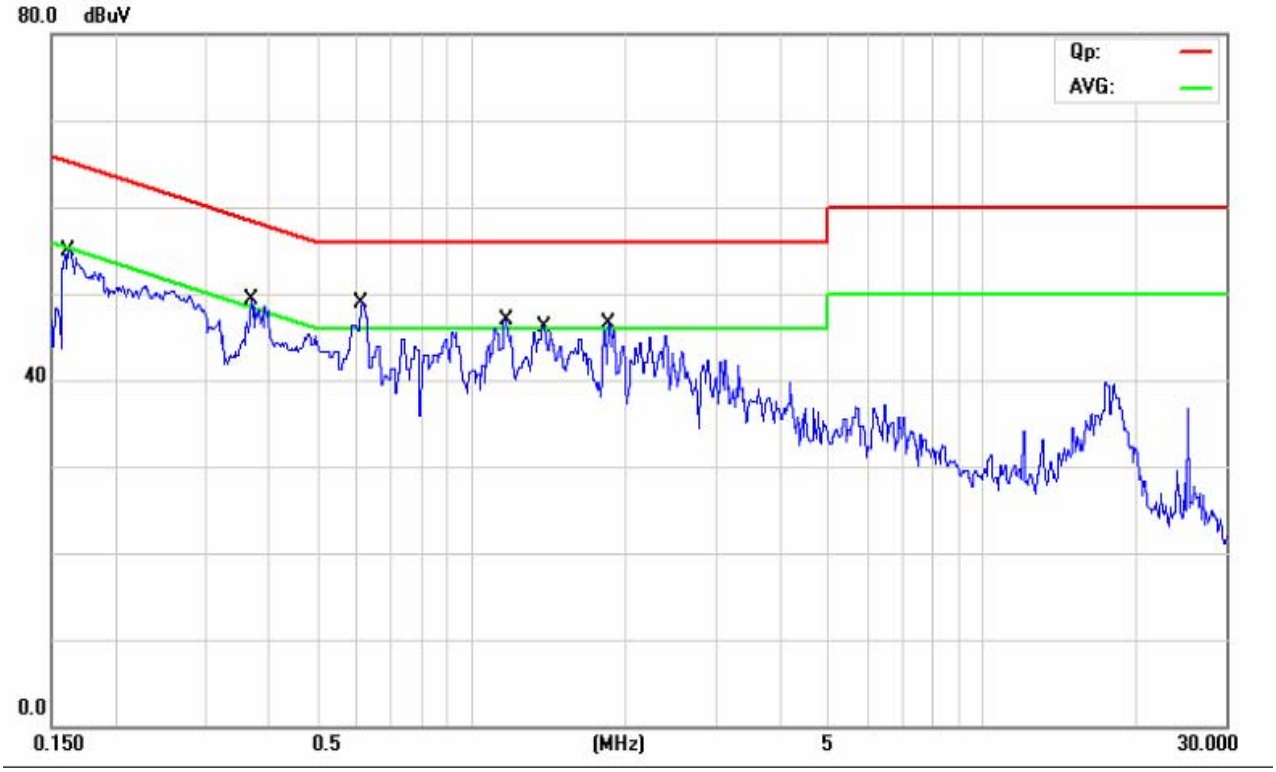
Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Line		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.2006	--	--	52.64	41.20	63.59	53.59
0.3704	--	---	49.16	39.84	58.49	48.49
0.6011	--	--	48.05	39.26	56.00	46.00
0.6573	--	---	47.54	39.15	56.00	46.00
0.8600	--	--	46.79	38.67	56.00	46.00
1.3662	--	--	46.98	38.26	56.00	46.00

D **Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)**

EUT set Condition: Running notebook test program , Ping network and Keep Bluetooth Transmitting

Results: **Pass**

Please refer to following diagram for individual



Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1621	53.36	44.85	--	--	65.36	55.36
0.3687	47.56	38.79	--	--	58.53	48.53
0.6124	47.81	39.60	--	--	56.00	46.00
1.1635	45.64	36.31	--	--	56.00	46.00
1.3772	46.35	36.81	--	--	56.00	46.00
1.8500	45.02	34.21	--	--	56.00	46.00

6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988

(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.

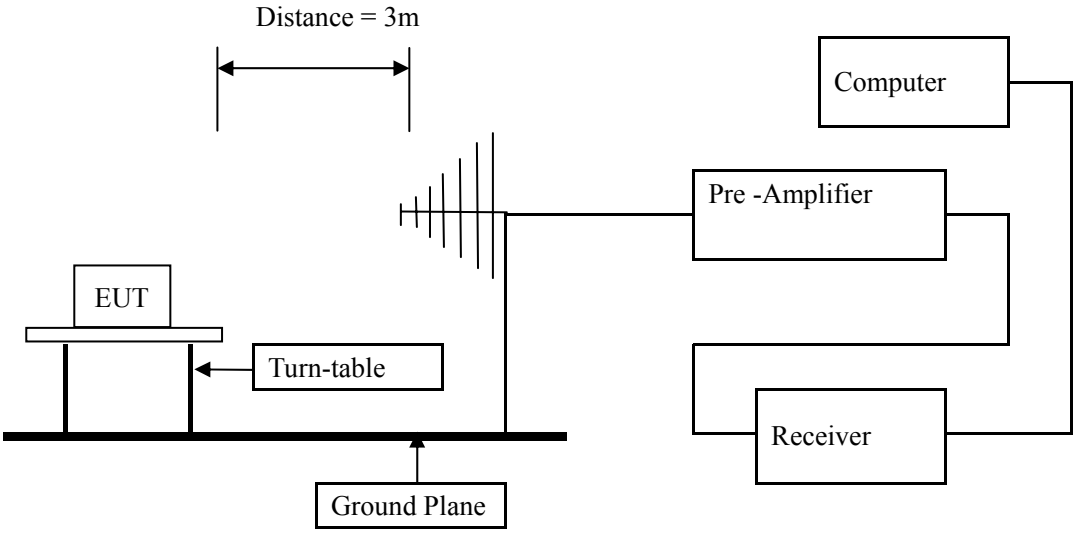
(3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.

(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.

(6) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.109. 15.209

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the higher limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. Two antennas used in the EUT. RF Module Control Unit can check the signal strength of the two antennas, and decide use which one through control the RF switch unit. In the same time just One Antenna is working. Pre-scanning tests for the both antennas and the worse case data is recorded

Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal (30MHz----1000MHz)

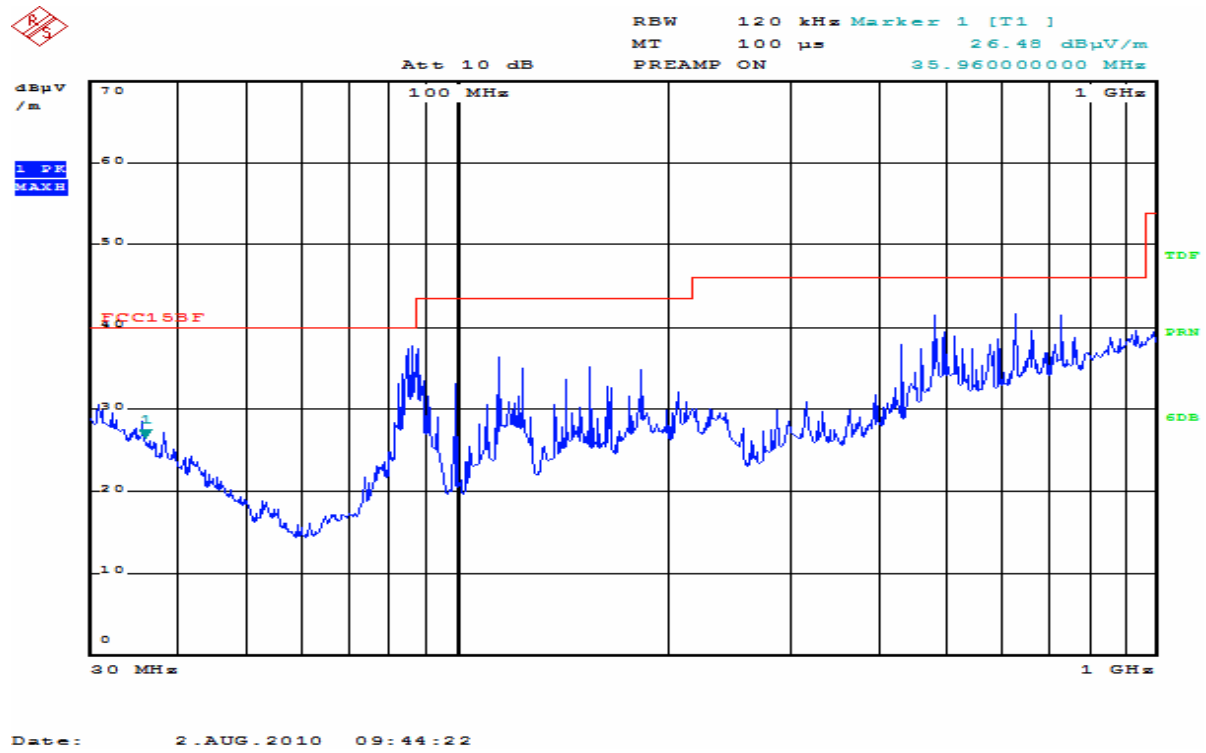
EUT set Condition: Read USB, TF card and Running EMC test software and Ping wireless network

Results: **Pass**

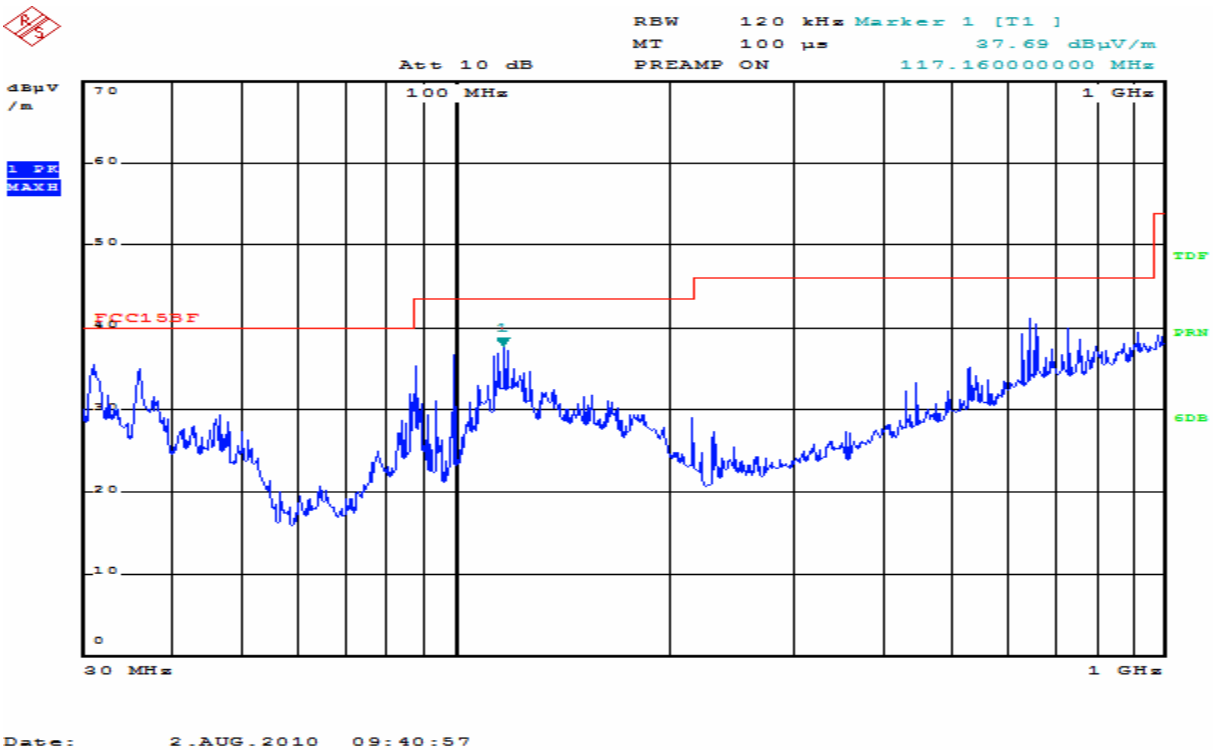
Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
86.36	30.19	H	40.00
115.64	24.83	H	43.50
481.00	33.74	H	46.00
35.96	30.12	V	40.00
99.56	38.35	V	43.50
117.16	30.87	V	43.50

Test Figure:

H



V



Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal (30MHz----1000MHz)

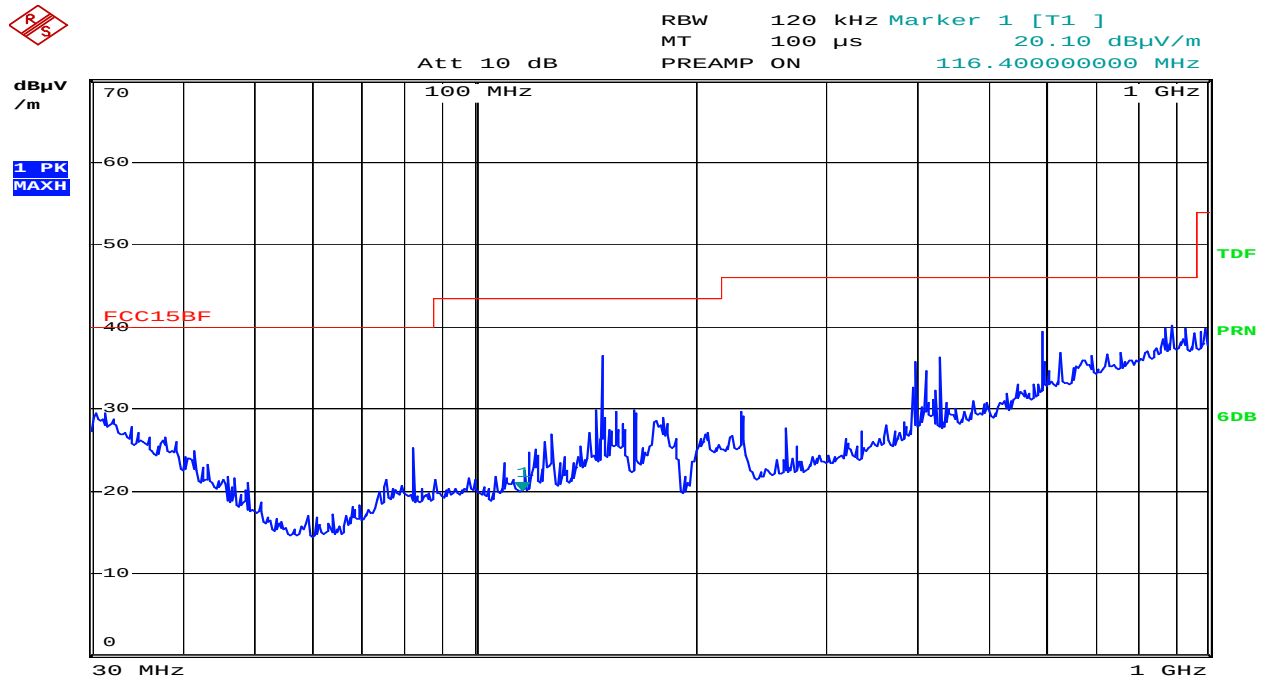
EUT set Condition: Running notebook test program , Ping network and Keep Bluetooth Transmitting

Results: **Pass**

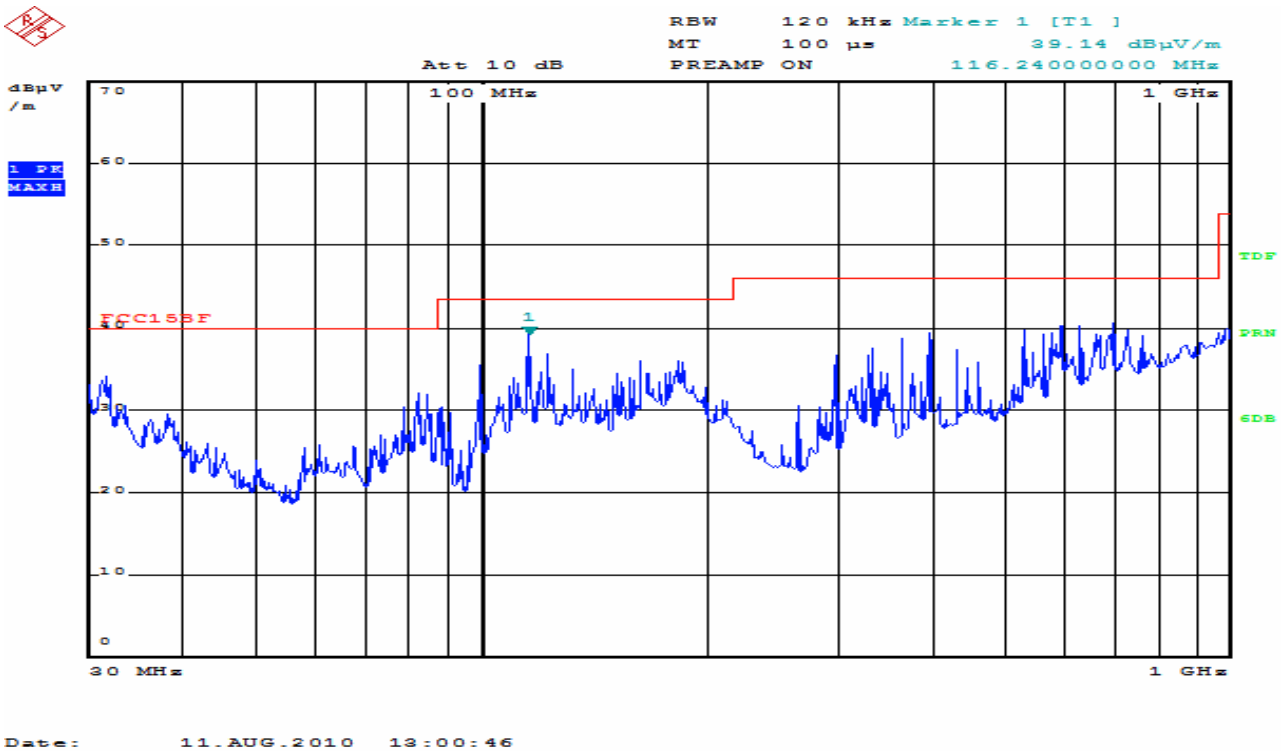
Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
158.62	29.54	H	43.50
399.65	26.89	H	46.00
598.38	28.41	H	46.00
99.85	31.25	V	43.50
116.40	30.85	V	43.50
398.46	31.67	V	46.00

Test Figure:

H



V



Operation Mode: Transmitting under Low Channel (2402MHz)

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2402	87.2（PK）/76.8（AV）	V	Fundamental Frequency
2402	91.2（PK）/81.5（AV）	H	
4804	--	H/V	74(Peak)/ 54(AV)
7206	--	H/V	74(Peak)/ 54(AV)
9608	--	H/V	74(Peak)/ 54(AV)
12010	--	H/V	74(Peak)/ 54(AV)
14412	--	H/V	74(Peak)/ 54(AV)
16814	--	H/V	74(Peak)/ 54(AV)
19216	--	H/V	74(Peak)/ 54(AV)
21618	--	H/V	74(Peak)/ 54(AV)
24020	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

Operation Mode: Transmitting g under Middle Channel (2441MHz)

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2441	85.6（PK）/78.2（AV）	H	Fundamental Frequency
2441	82.2（PK）/72.9（AV）	V	
4882.	--	H	74(Peak)/ 54(AV)
7323	--	H/V	74(Peak)/ 54(AV)
9764	--	H/V	74(Peak)/ 54(AV)
12205	--	H/V	74(Peak)/ 54(AV)
14646	--	H/V	74(Peak)/ 54(AV)
17087	--	H/V	74(Peak)/ 54(AV)
19528	--	H/V	74(Peak)/ 54(AV)
21969	--	H/V	74(Peak)/ 54(AV)
24410	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

Operation Mode: Transmitting under High Channel

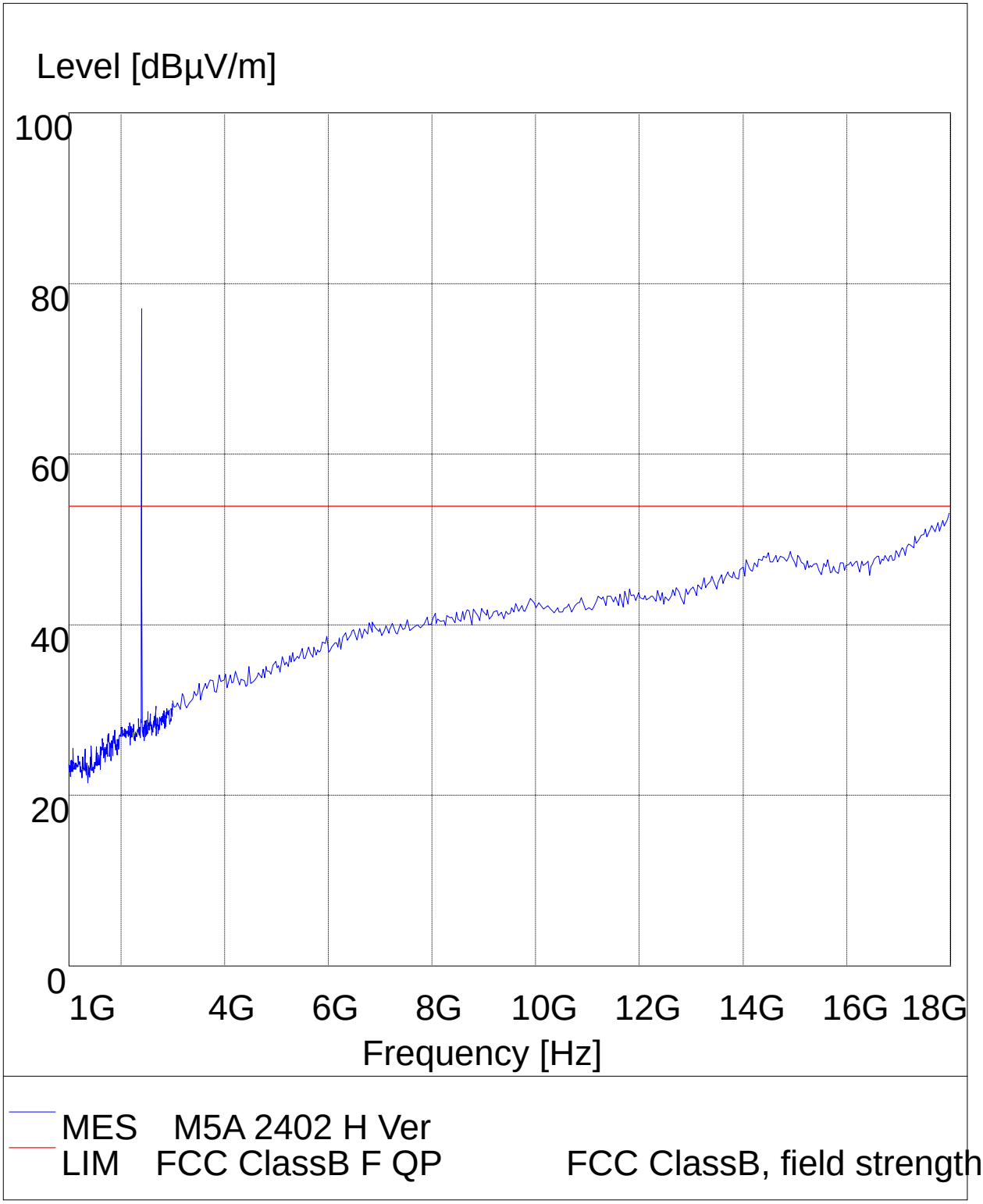
Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2480	93.2（PK）/81.7（AV）	H	Fundamental Frequency
2480	89.2（PK）/78.3（AV）	V	
4960	--	H/V	74(Peak)/ 54(AV)
7440	--	H/V	74(Peak)/ 54(AV)
9920	--	H/V	74(Peak)/ 54(AV)
12400	--	H/V	74(Peak)/ 54(AV)
14880	--	H/V	74(Peak)/ 54(AV)
17360	--	H/V	74(Peak)/ 54(AV)
19840	--	H/V	74(Peak)/ 54(AV)
22320	--	H/V	74(Peak)/ 54(AV)
24800	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

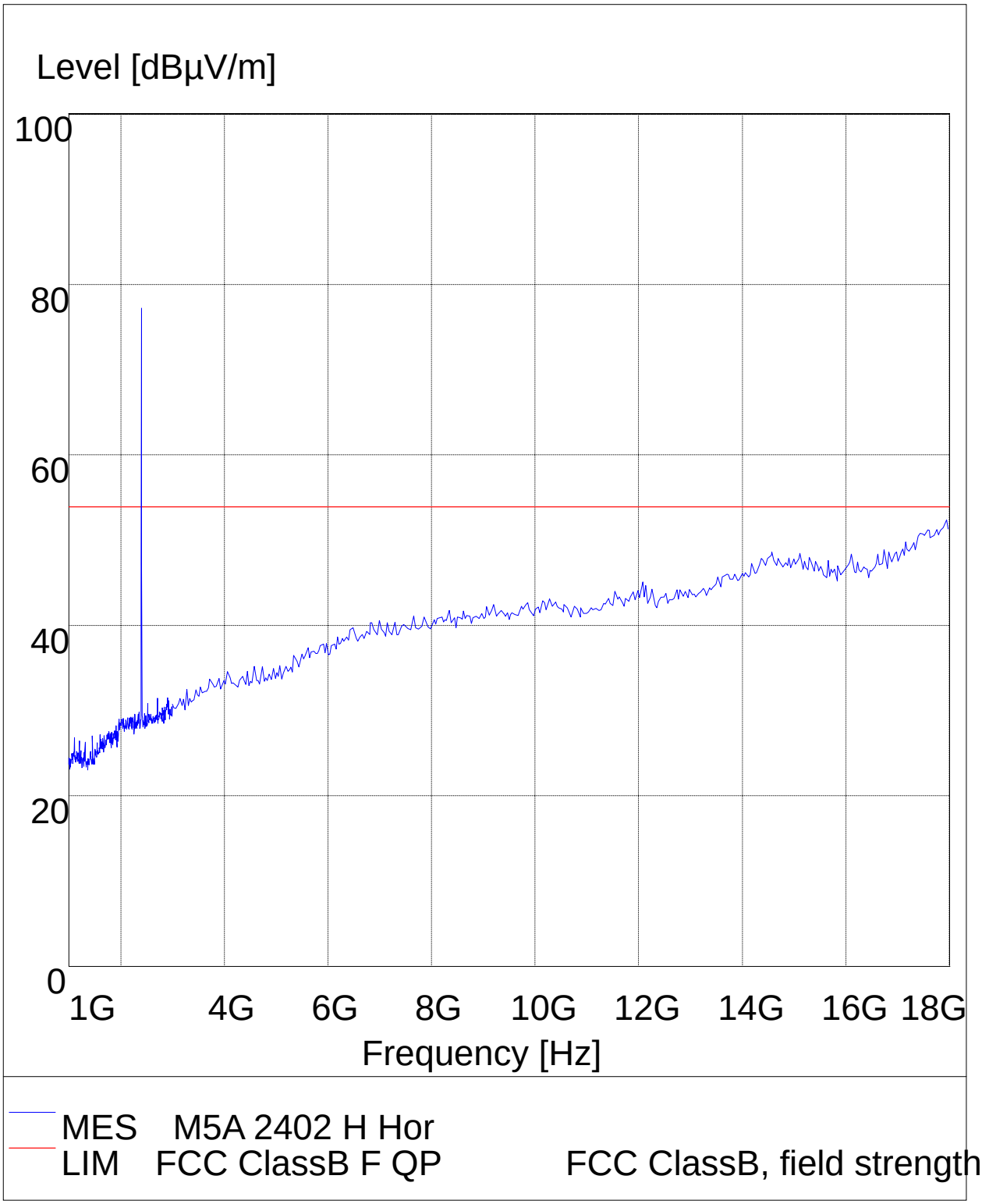
2. Remark “---” means that the emissions level is too low to be measured

Please refer to the following test plots for details:

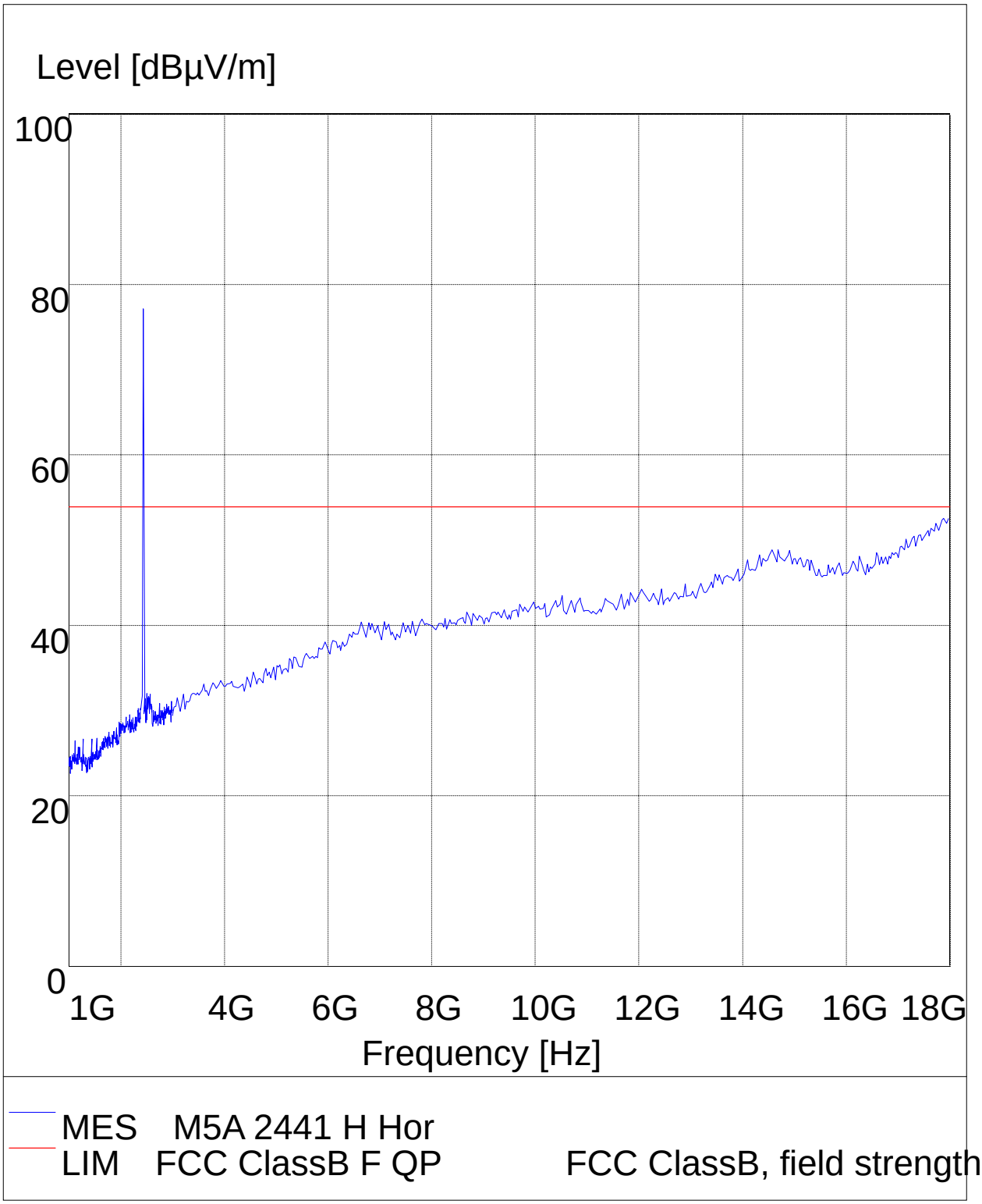
Low Channel: Vertical



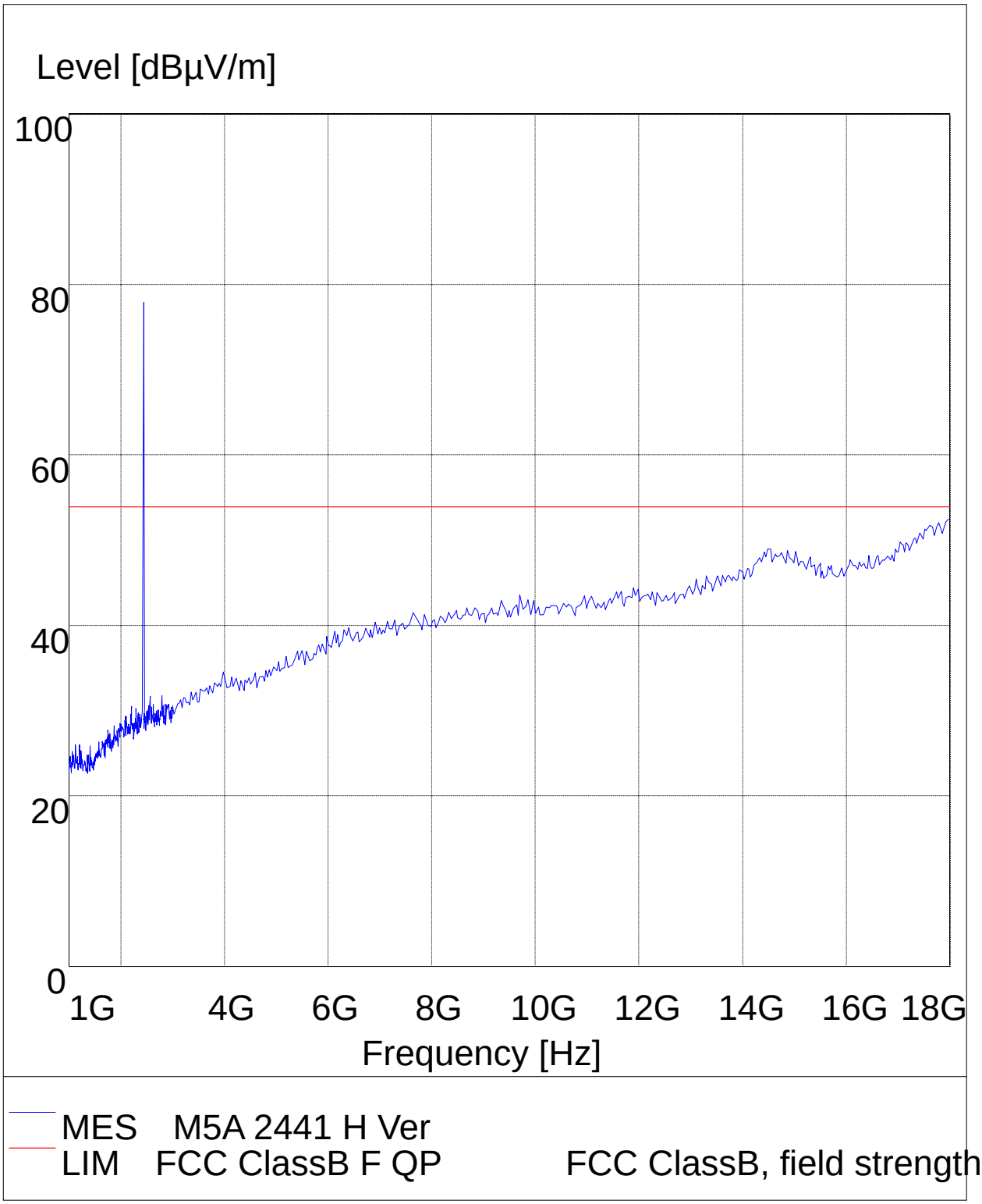
Low Channel : Horizontal



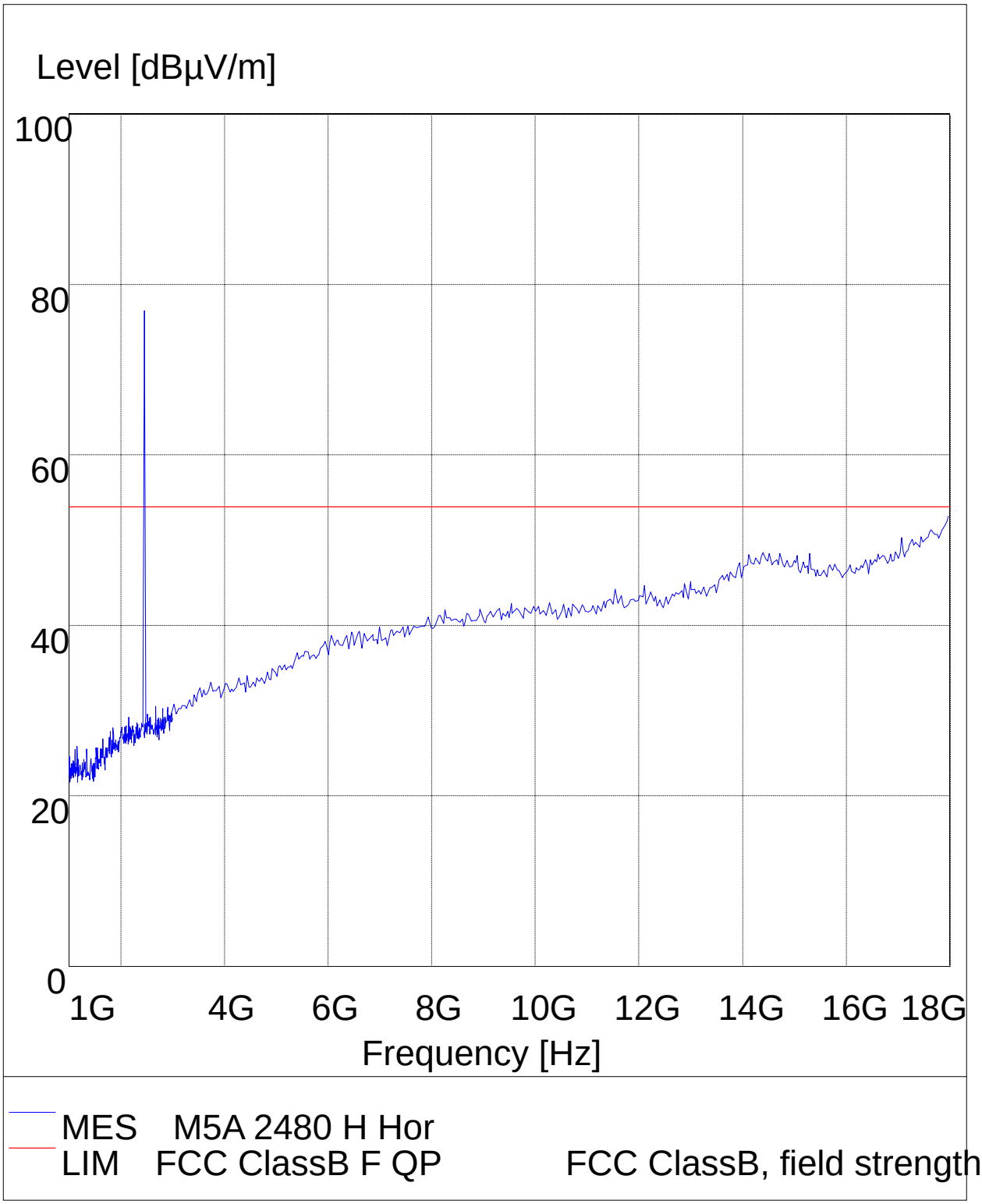
Middle Channel : Horizontal



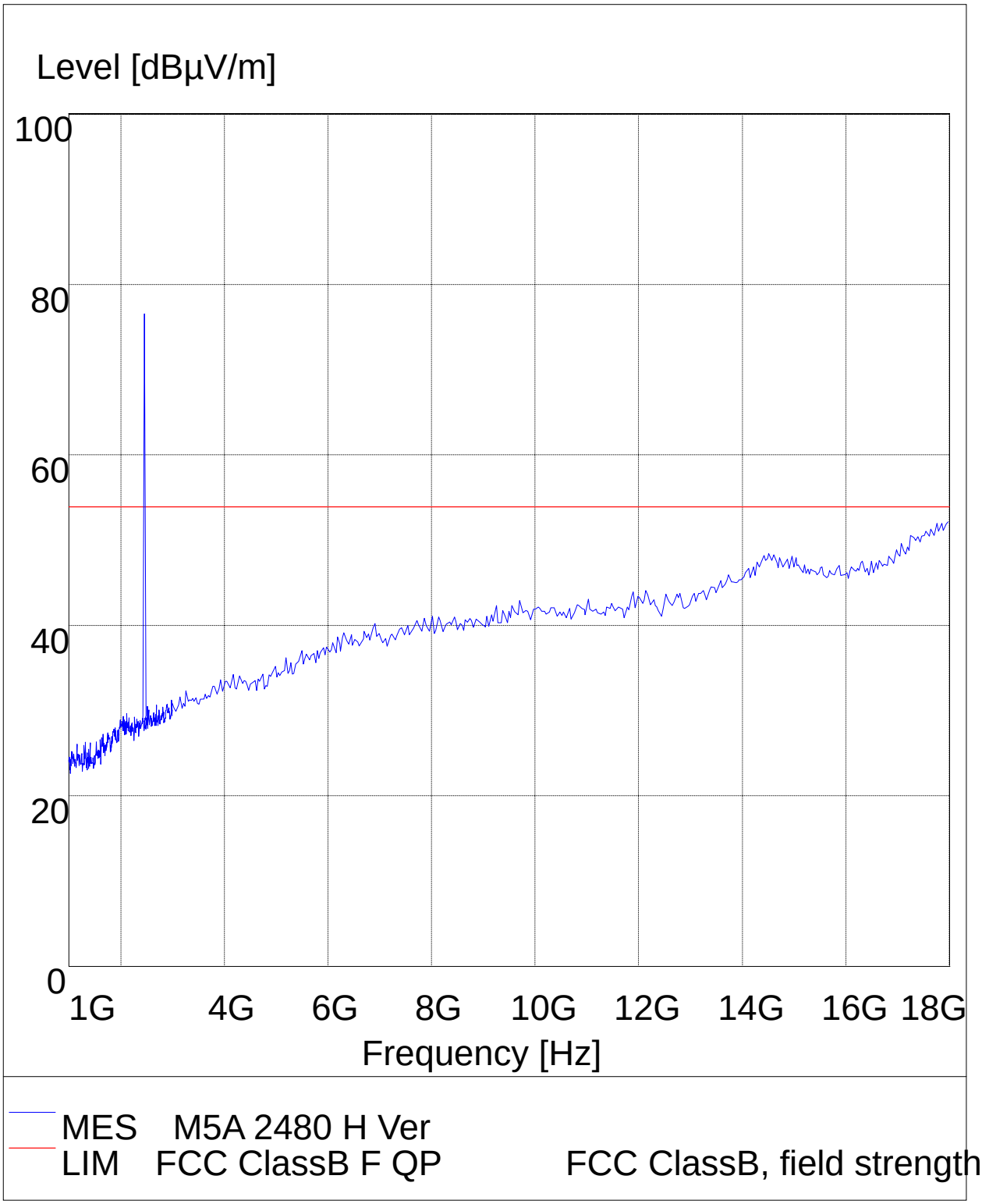
Middle Channel :: Vertical



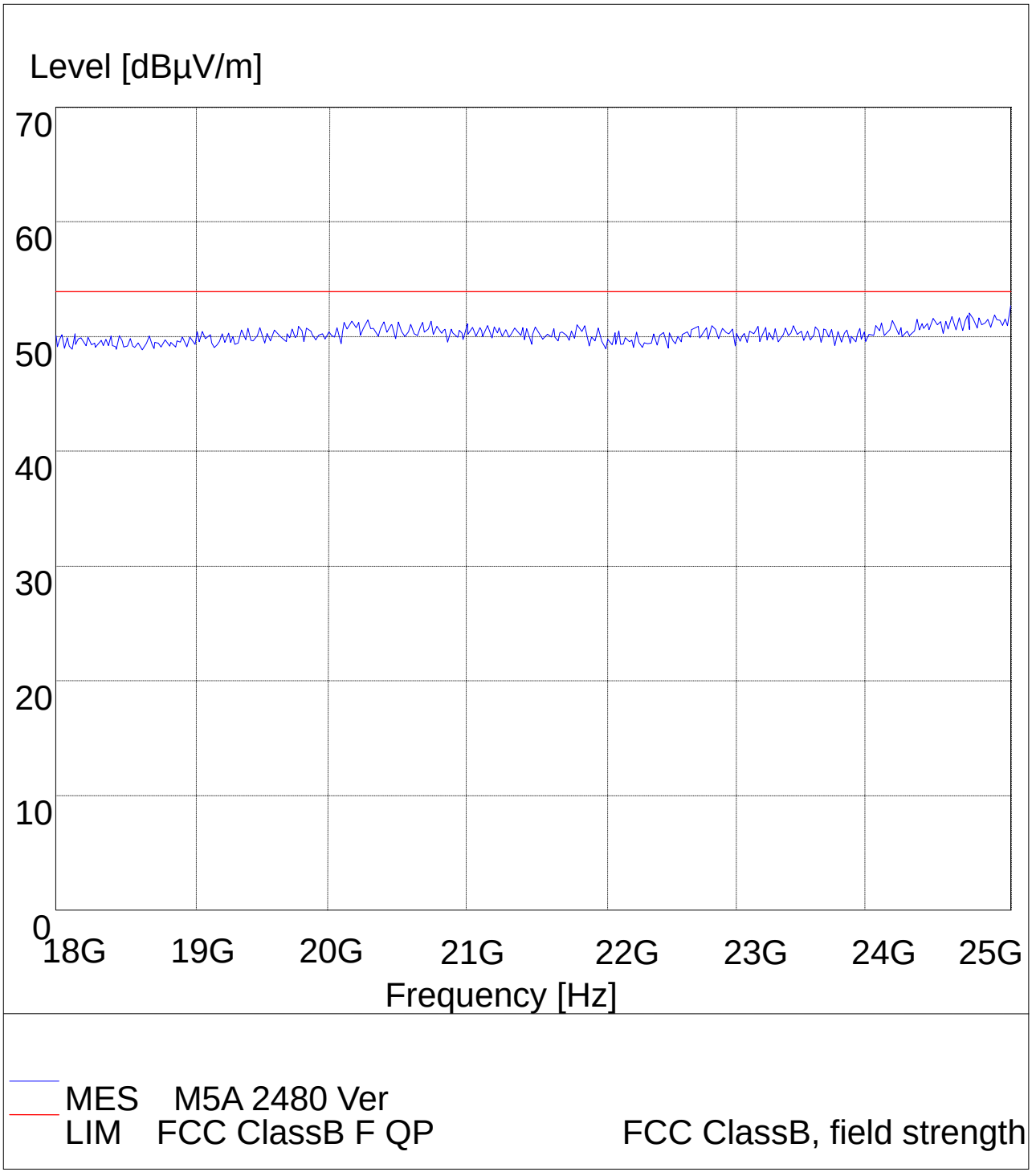
High Channel : Horizontal



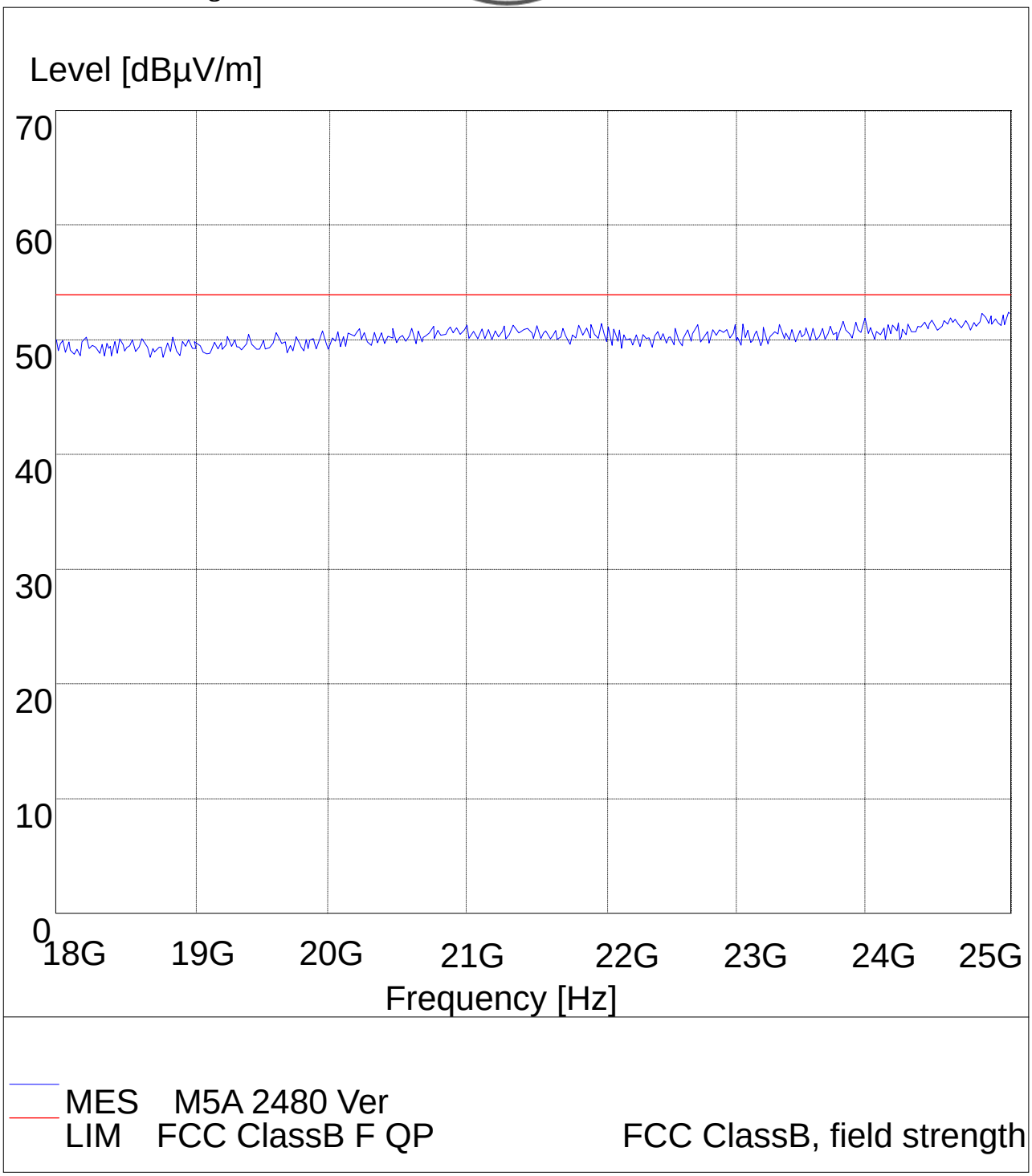
High Channel : Vertical



18-25G Horizontal High Channel



18-25G Vertical High Channel



7.0 20dB Bandwidth Measurement

7.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.2 Limits of 20dB Bandwidth Measurement

N/A

7.3 Test Procedure.

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.

2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW ≥ RBW Sweep = auto Detector function = peak Trace = max hold

3. Measure the highest amplitude appearing on spectral display and record the level to calculate results. 6. Repeat above procedures until all frequencies measured were complete.

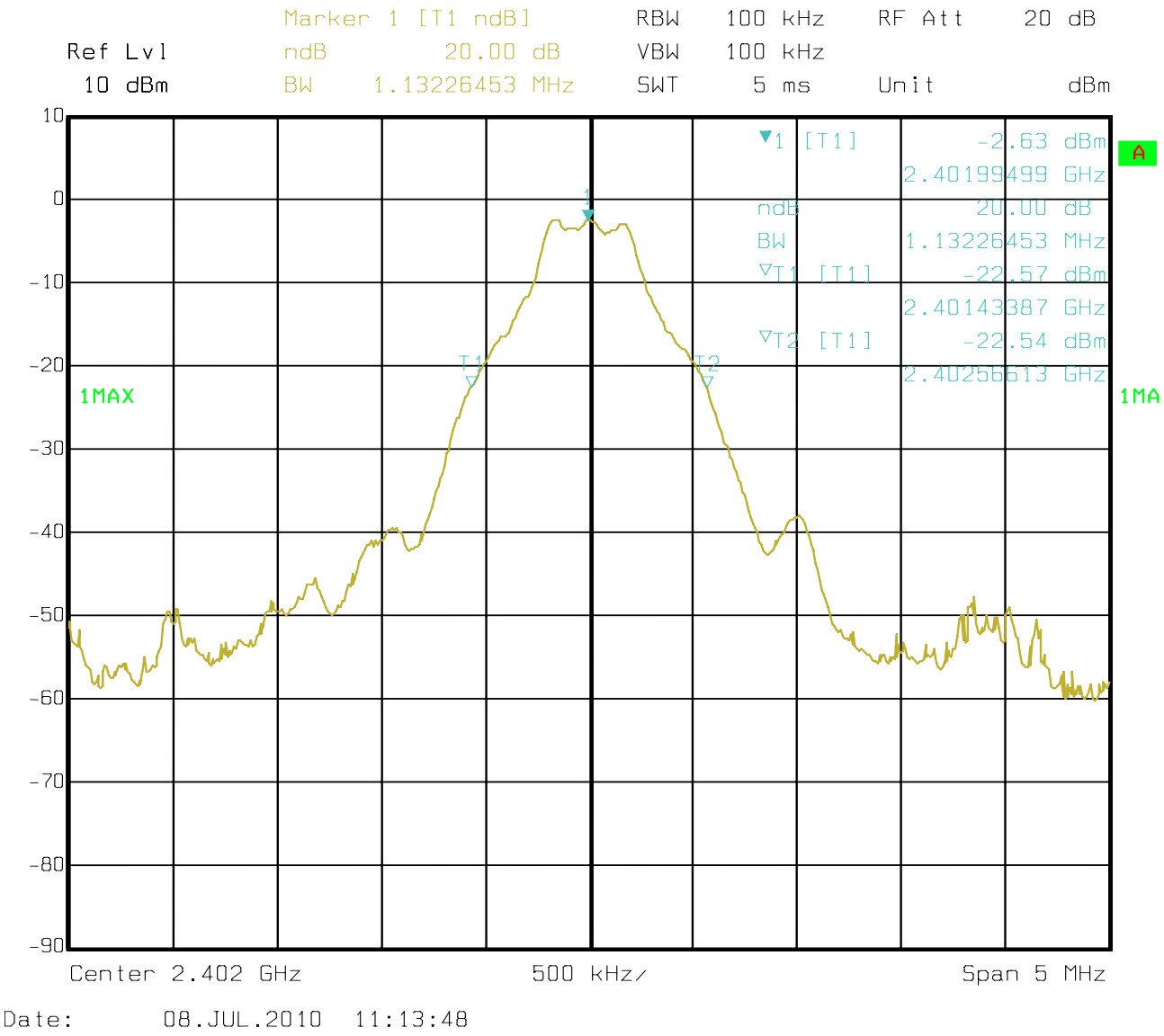
7.4 Test Result

EUT	NOTE BOOK	Model	M5A
Mode	Keep Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

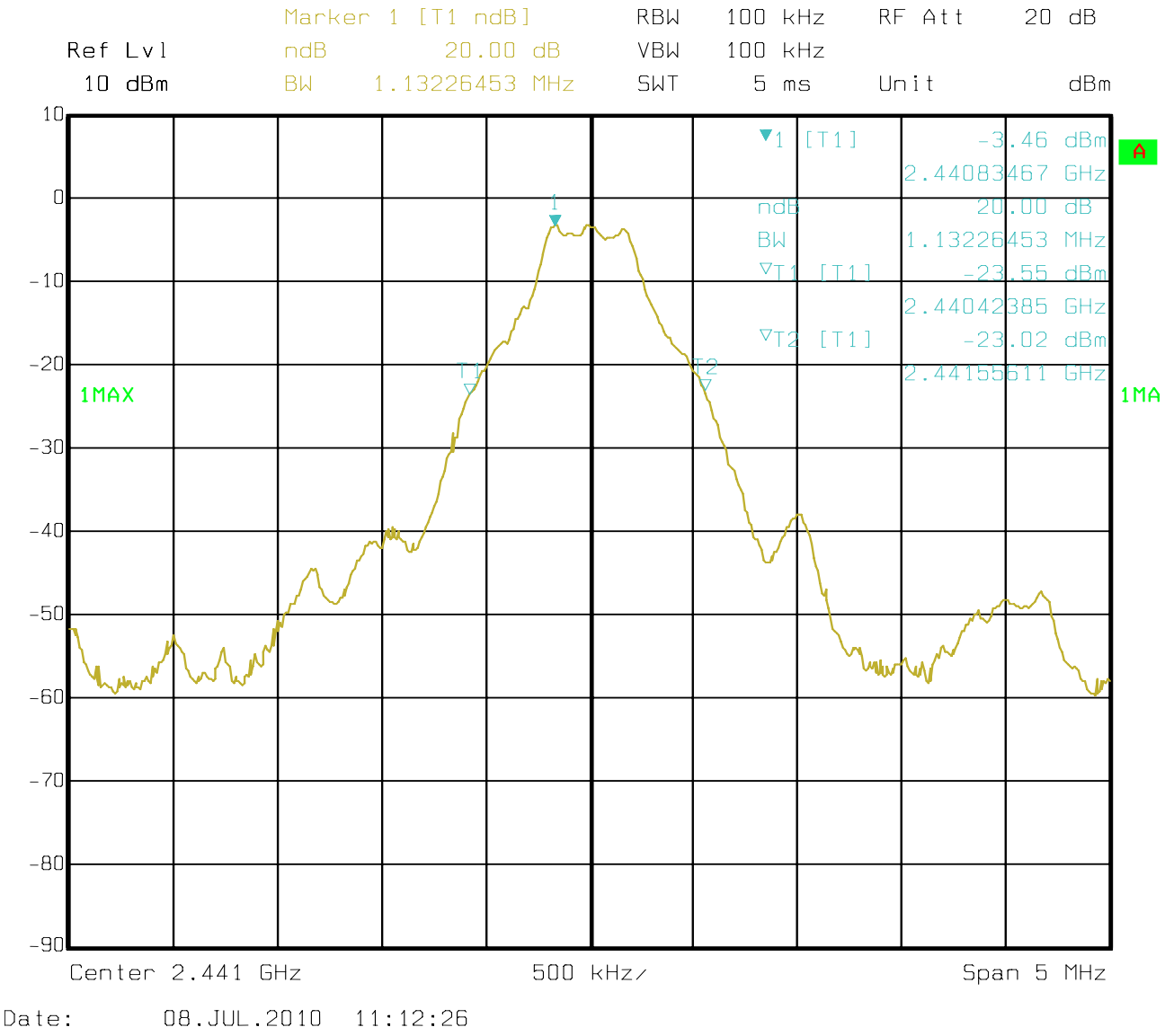
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail
Low	2402	1132.3	--	Pass
Middle	2441	1132.3	--	Pass
High	2480	1112.2	--	Pass

Test Figure:

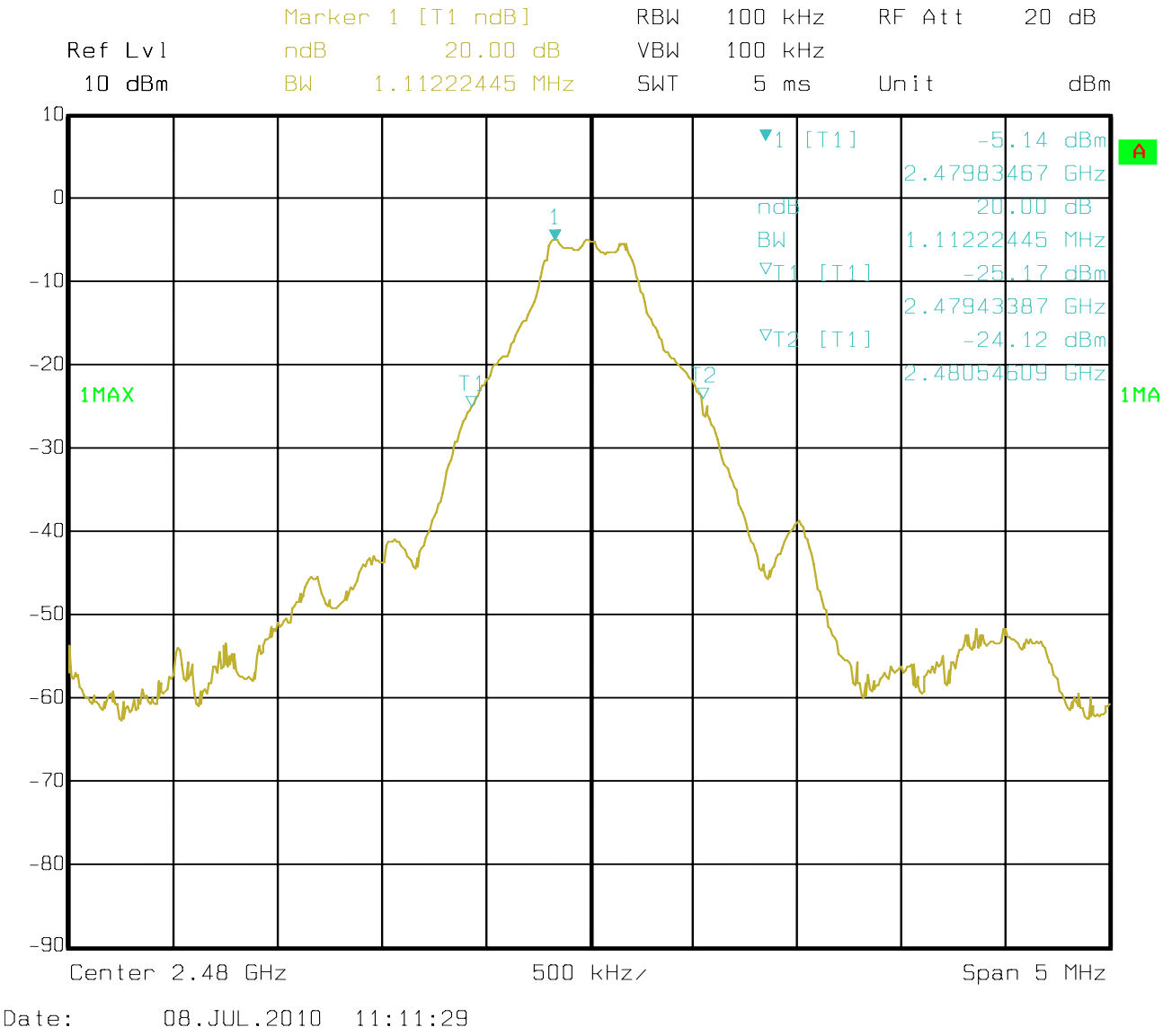
1. Condition: Low Channel



2. Condition: Middle Channel



3. High Channel



8. Maximum Peak Output Power

8.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5MHz band:0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

8.3 Test Procedure

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel； RBW > the 20 dB bandwidth of the emission being measured； VBW ≥ RBW； Sweep = auto； Detector function = peak； Trace = max hold
3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
4. Repeat above procedures until all frequencies measured were complete.

8.4Test Results

EUT	NOTE BOOK	Model	M5A
Mode	Keep Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Low	2402	-2.91	30	Pass
Middle	2441	-3.68	30	Pass
High	2480	-5.38	30	Pass

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

9. Carrier Frequency Separation

9.1 Regulation

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

9.2 Limits of Carrier Frequency Separation

The Maximum Power Spectral Density Measurement is 25kHz or two-thirds of the 20dB bandwidth of the hopping Channel which is great.

9.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels: Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span; Video (or Average) Bandwidth (VBW) ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold
3. Measure the separation between the peaks of the adjacent channels using the marker-delta function.
4. Repeat above procedures until all frequencies measured were complete.

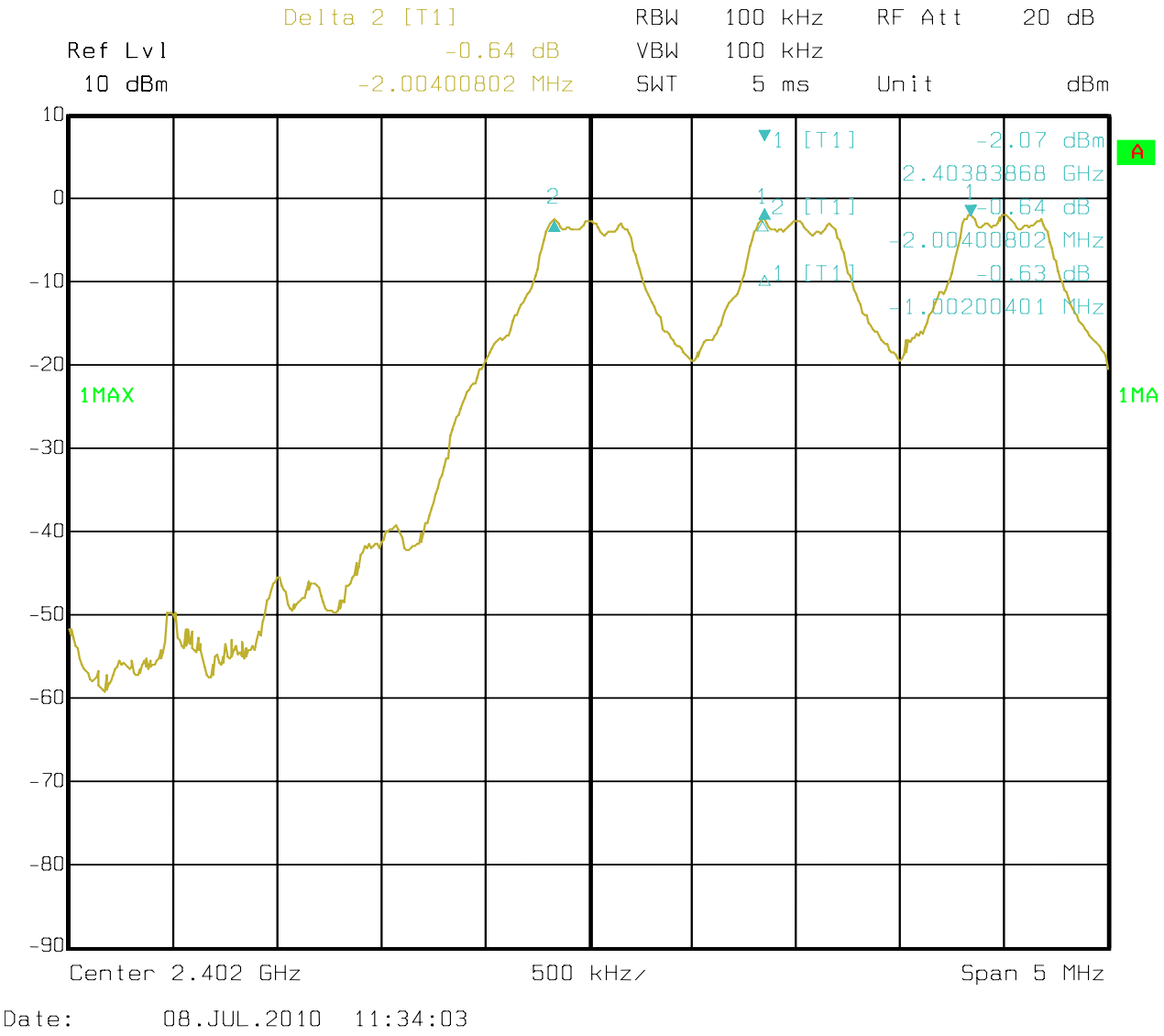
9.4Test Result

EUT	NOTE BOOK	Model	M5A
Mode	Keep Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Carrier Frequency Separation	Limit	Pass/ Fail
Middle	2402	1.02MHz	≥ 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel	Pass

Test Plots

Middle Channel



10. Number of Hopping Channels

10.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

10.2 Limits of Number of Hopping Channels

The frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

10.3 Test Procedure

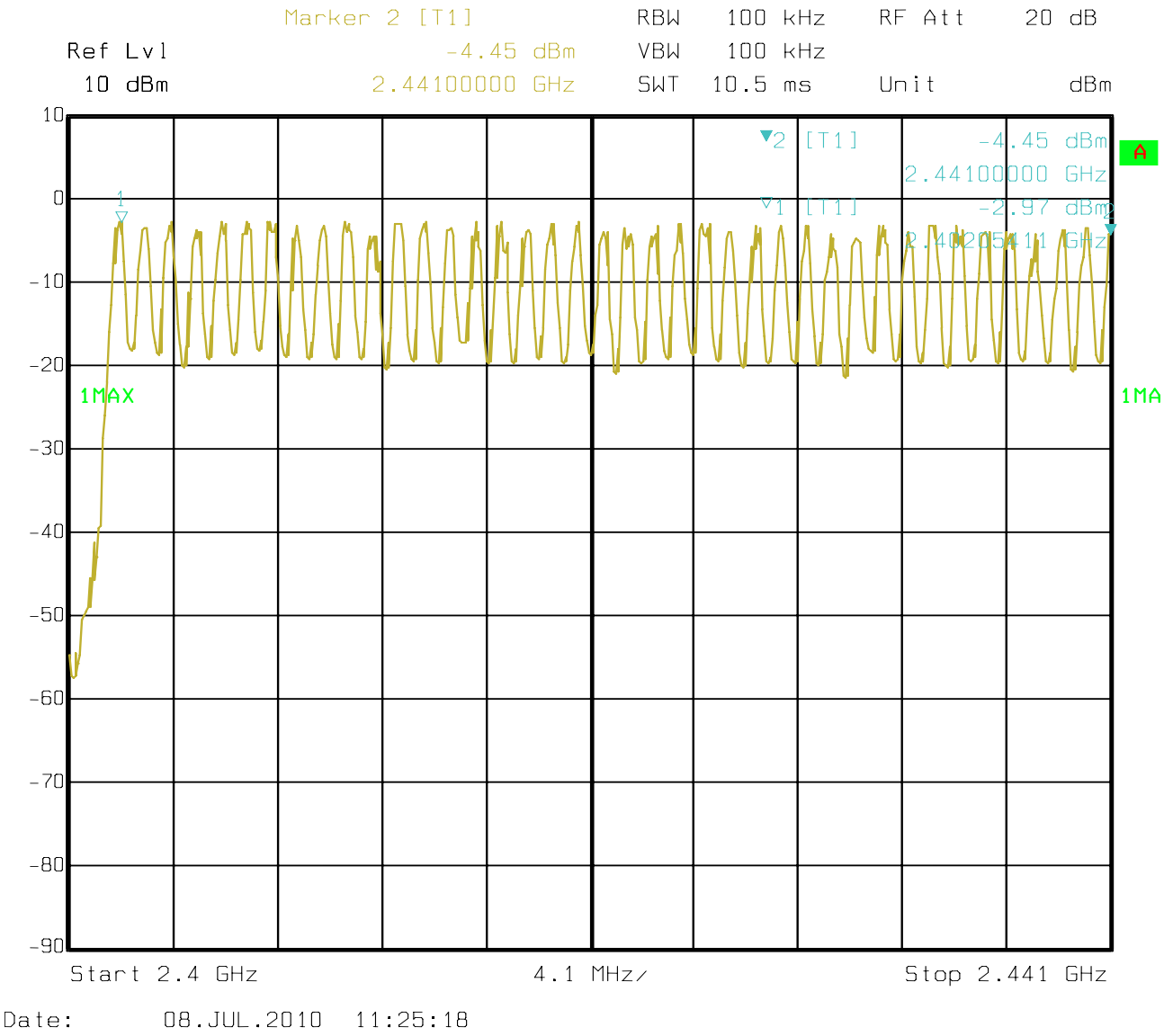
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold
3. Record the number of hopping channels.

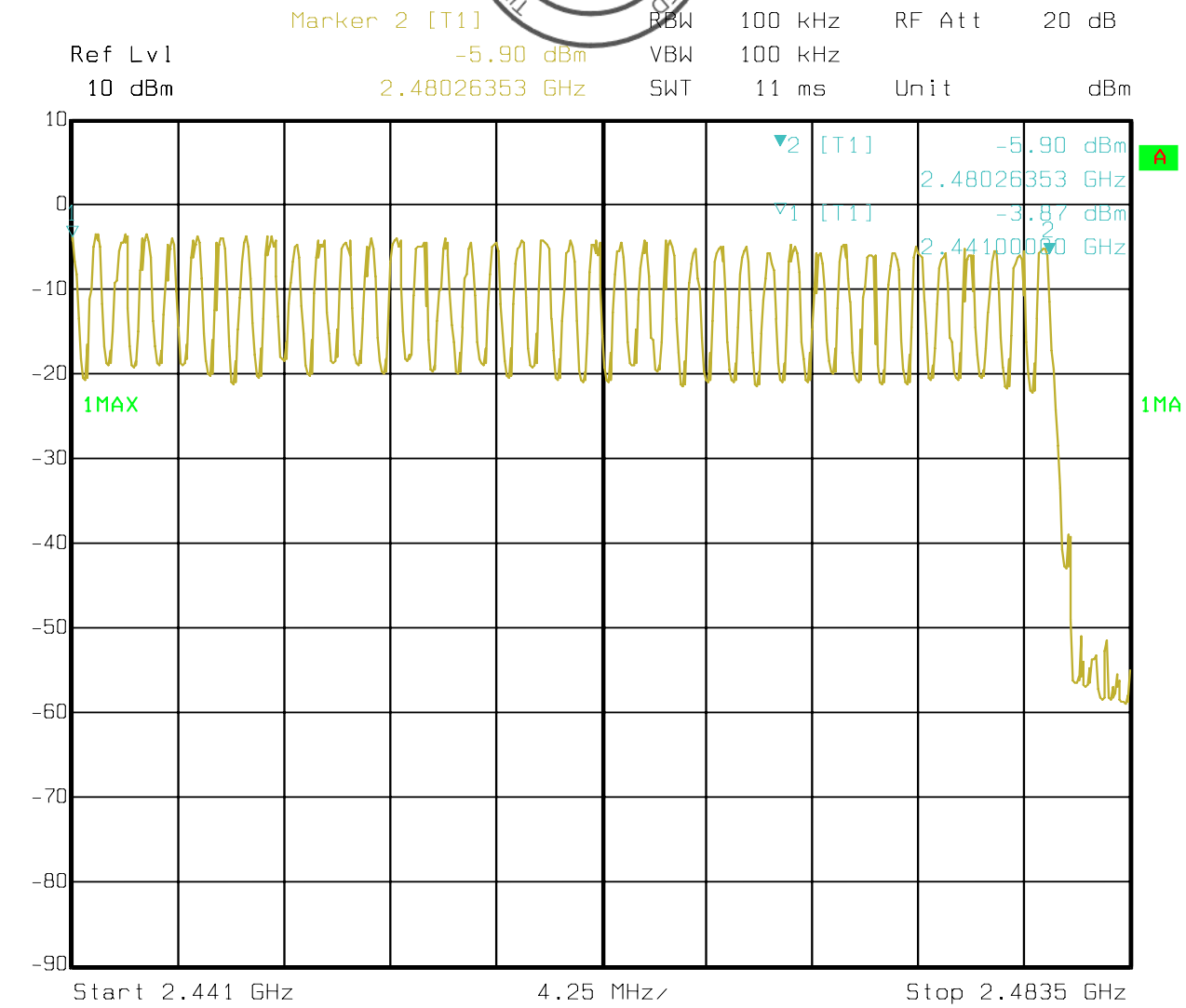
10.4Test Result

EUT	NOTE BOOK	Model	M5A
Mode	Keep Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Operating Frequency	Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz	79	≥ 15	Pass

Test Plot





11. Time of Occupancy (Dewell Time)

11.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

11.2 Limits of Carrier Frequency Separation

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed

11.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold
3. Measure the dwell time using the marker-delta function.
4. Repeat above procedures until all frequencies measured were complete.
5. Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

11.4 Test Result

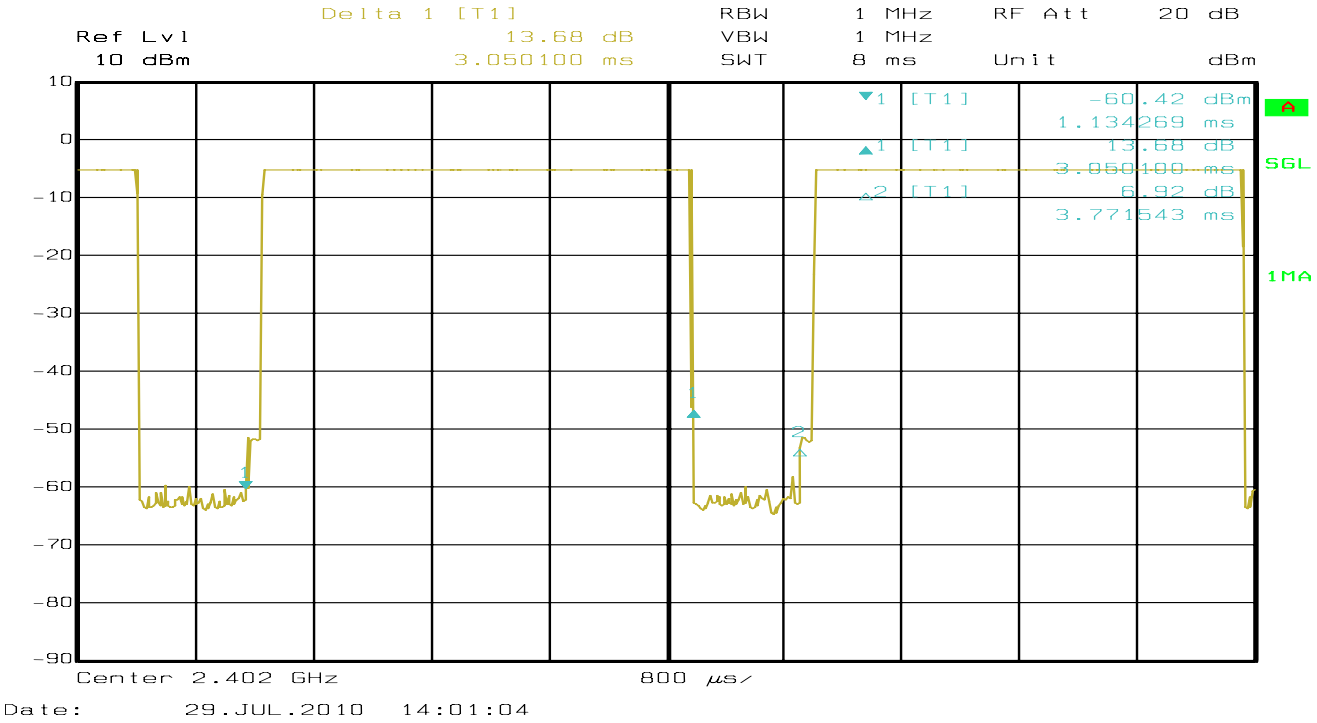
EUT	NOTE BOOK	Model	M5A
Mode	Keep Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Channel	Reading	Hoping Rate	Actual	Limit
Low	3.050	266.667 hop/s	0.325	0.4s
Middle	3.034	266.667 hop/s	0.324	0.4s
High	3.046	266.667 hop/s	0.325	0.4s

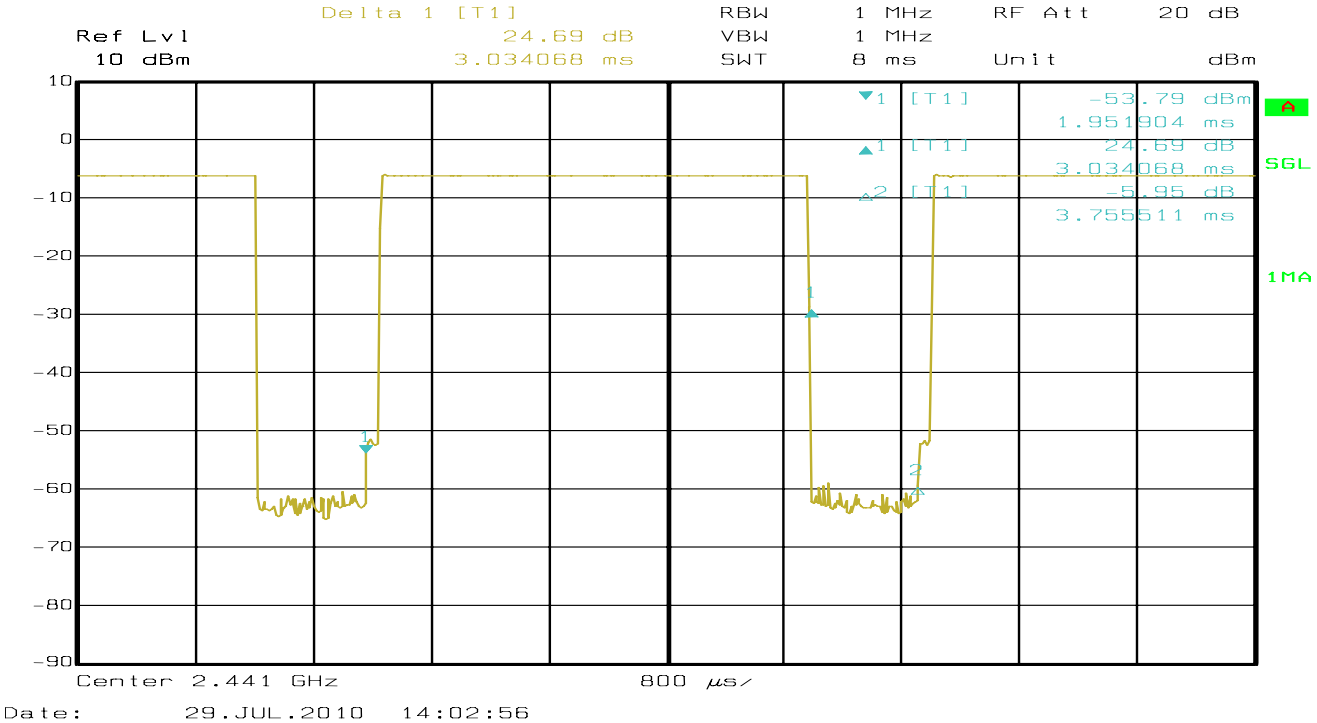
Actual = Reading × (Hopping rate / Number of channels) × Test period Test period = 0.4 [seconds / channel] × 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625μs with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels. And the DH5 is the worst case.

Test Plots:

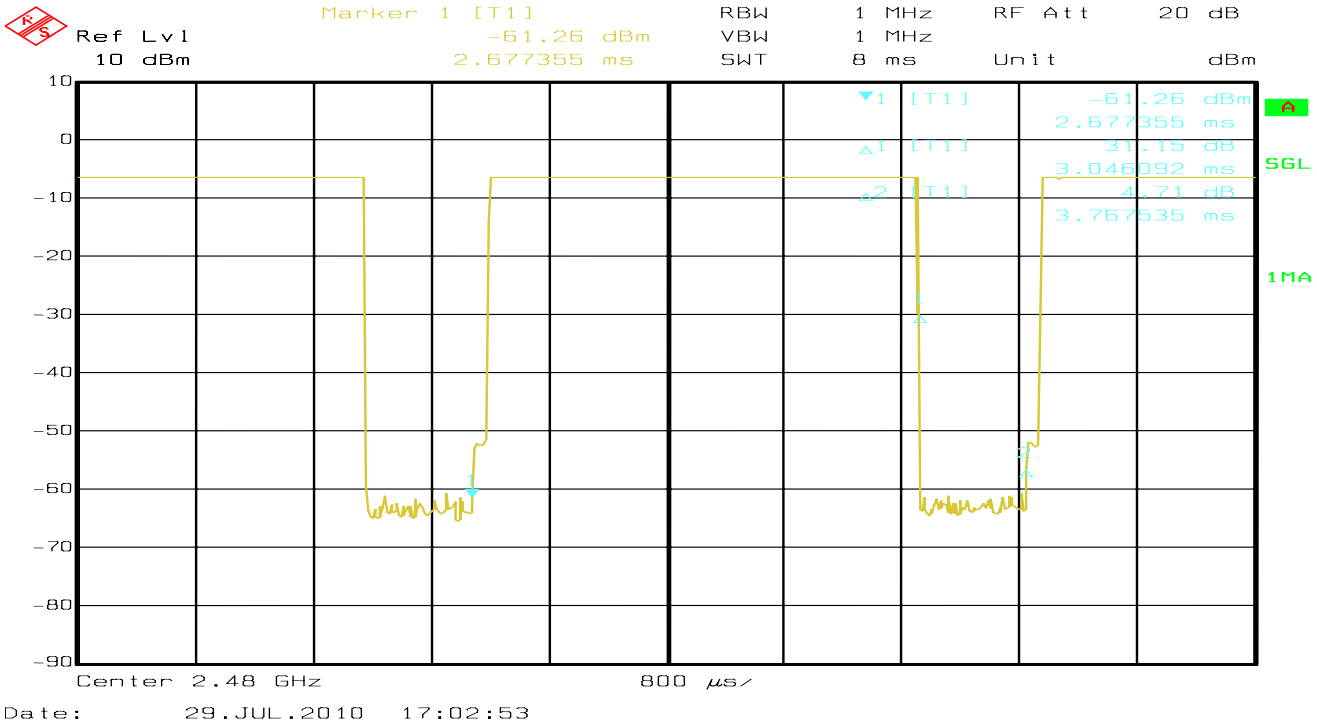
Low Channel: DH5



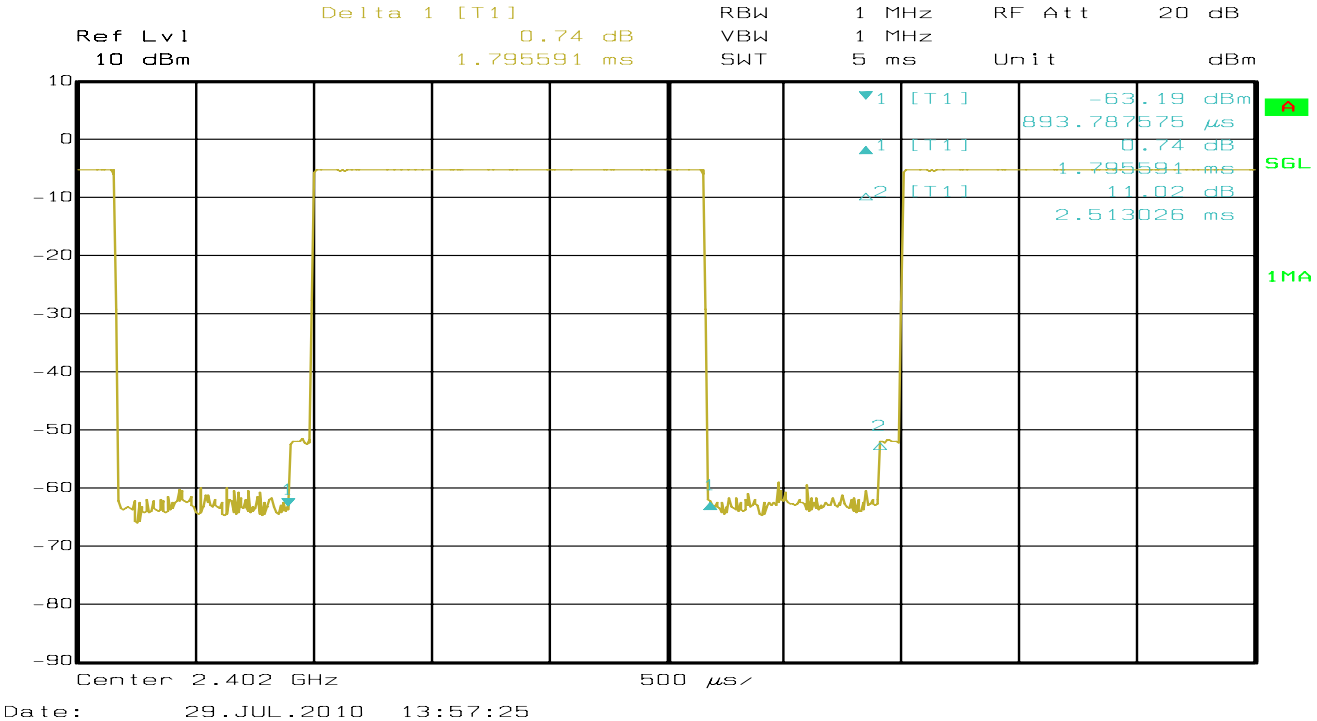
Middle Channel: DH5



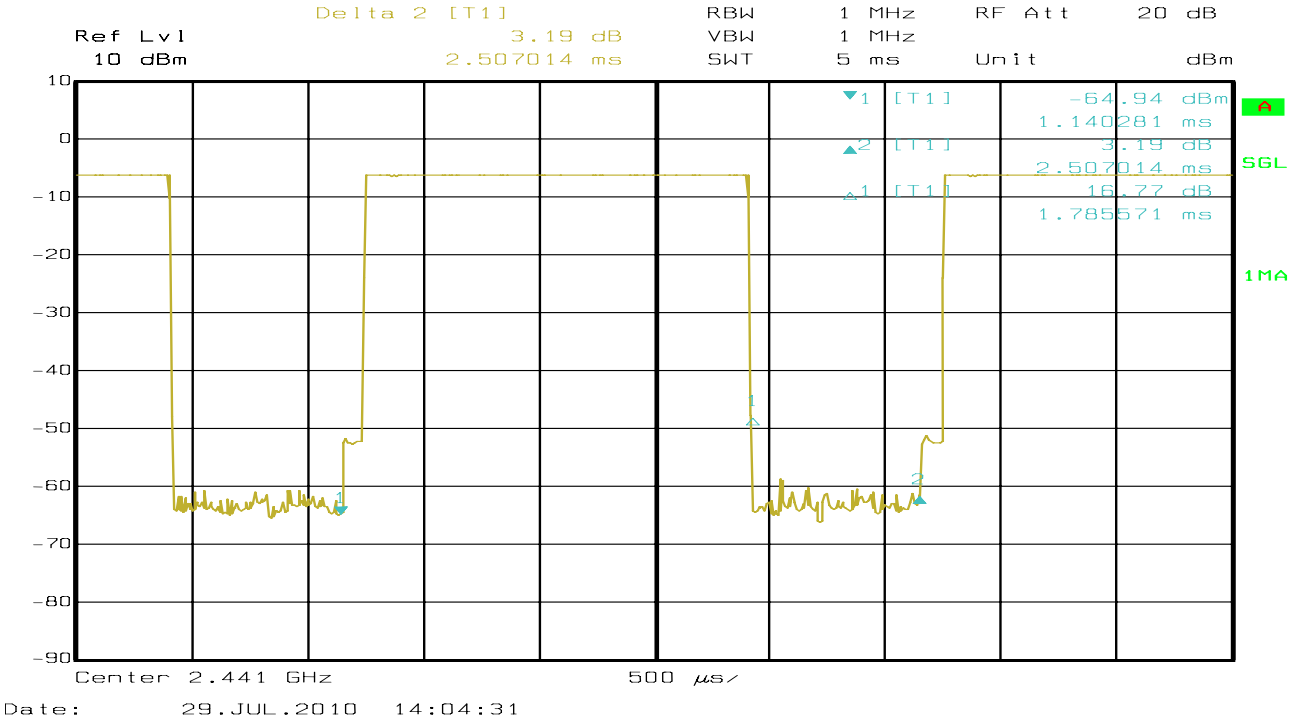
High Channel: DH5



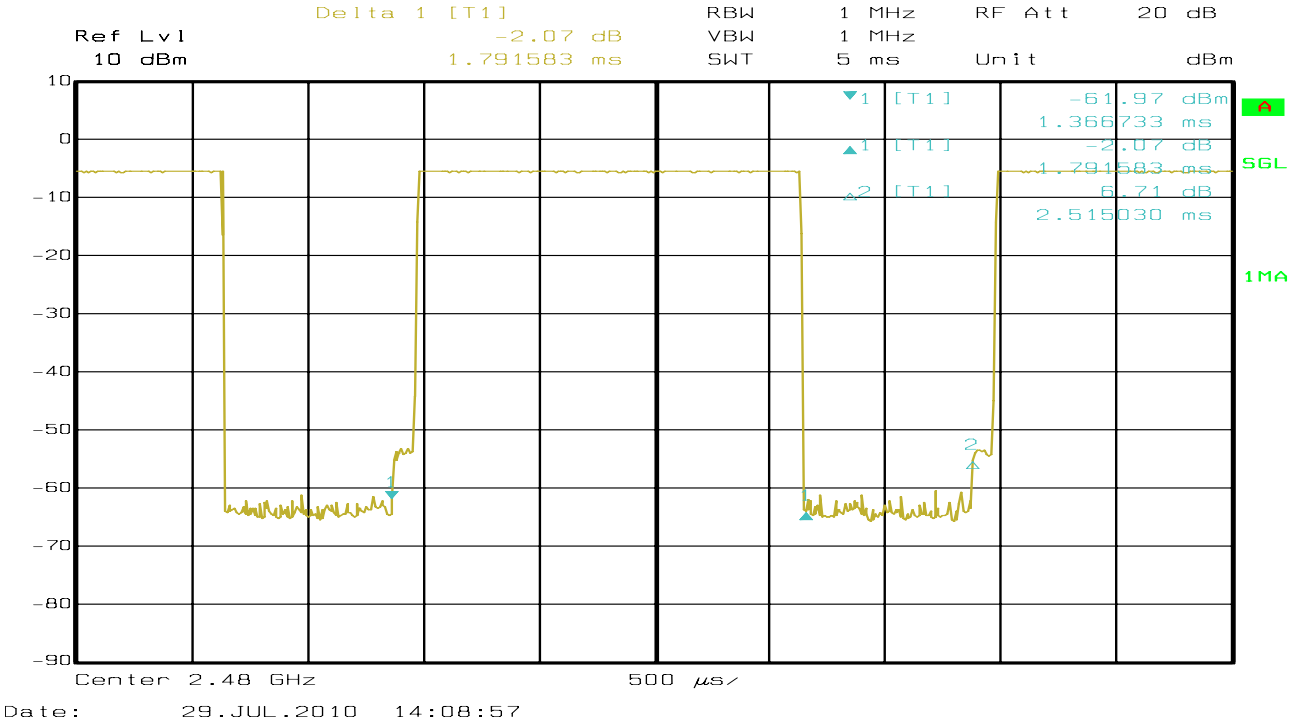
Low Channel: DH3



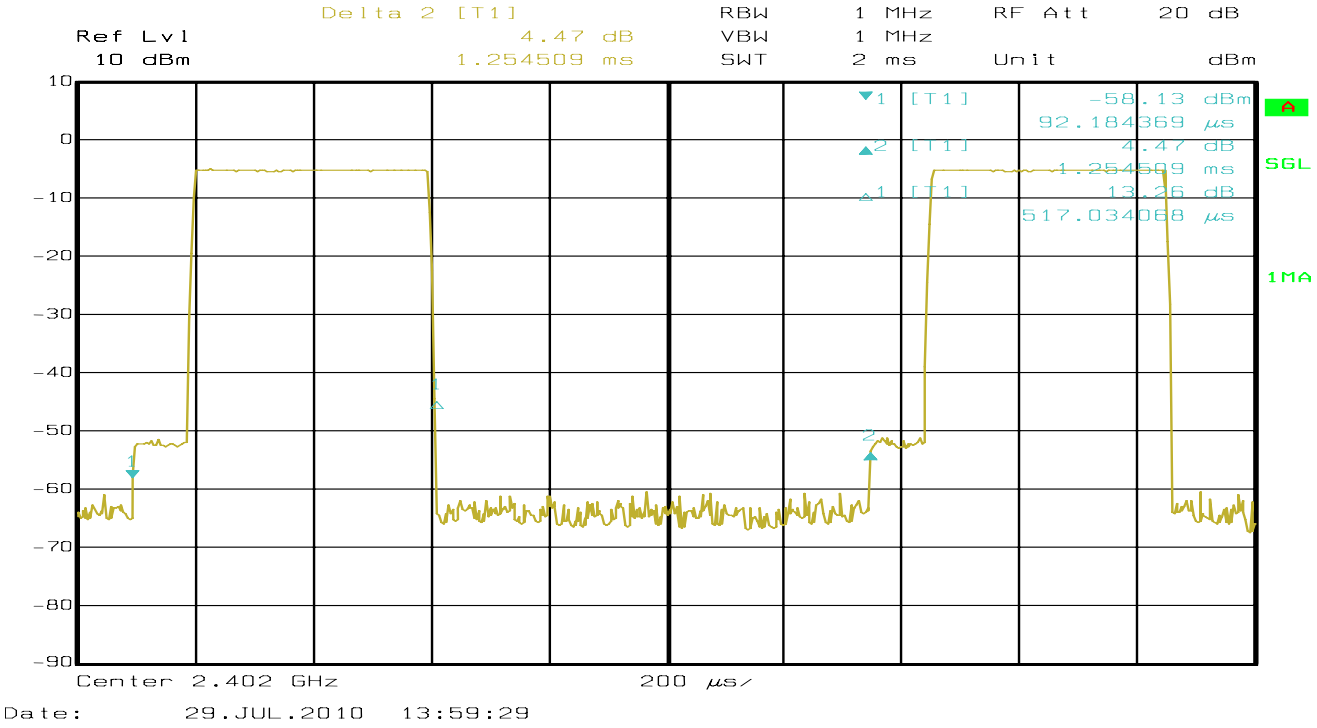
Middle Channel: DH3



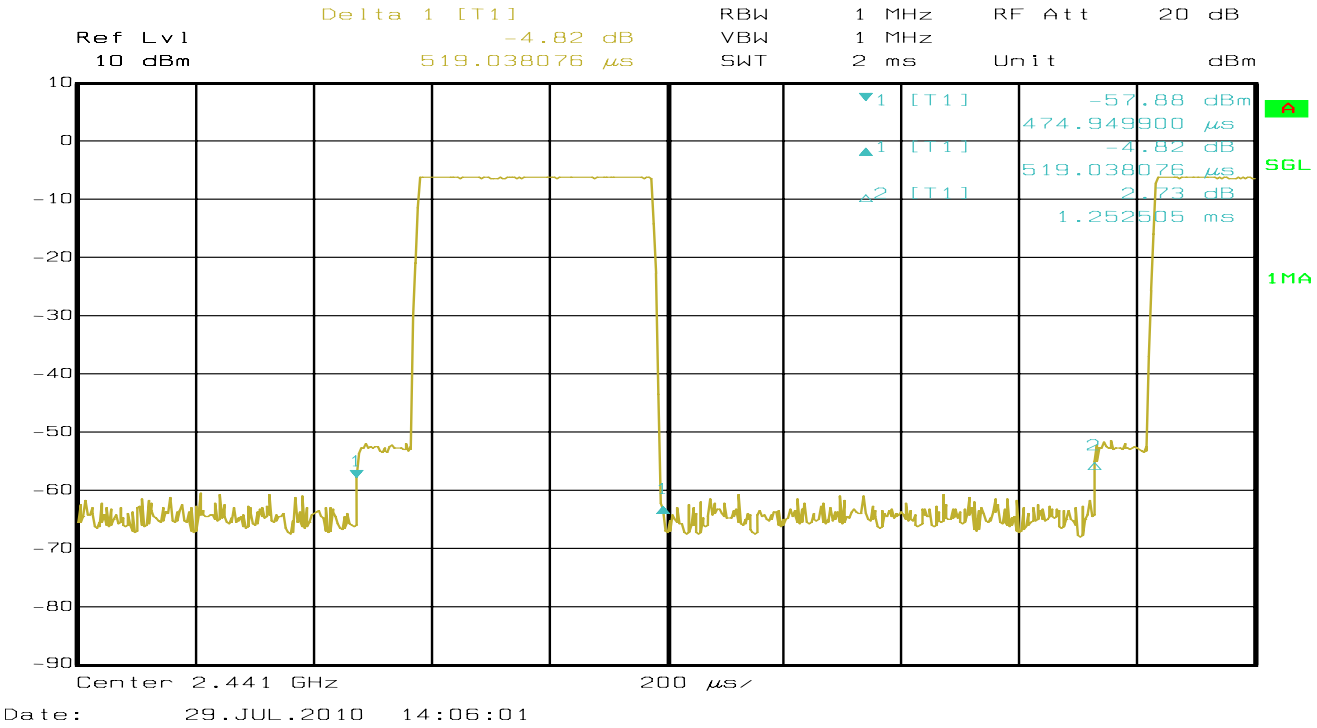
High Channel: DH3



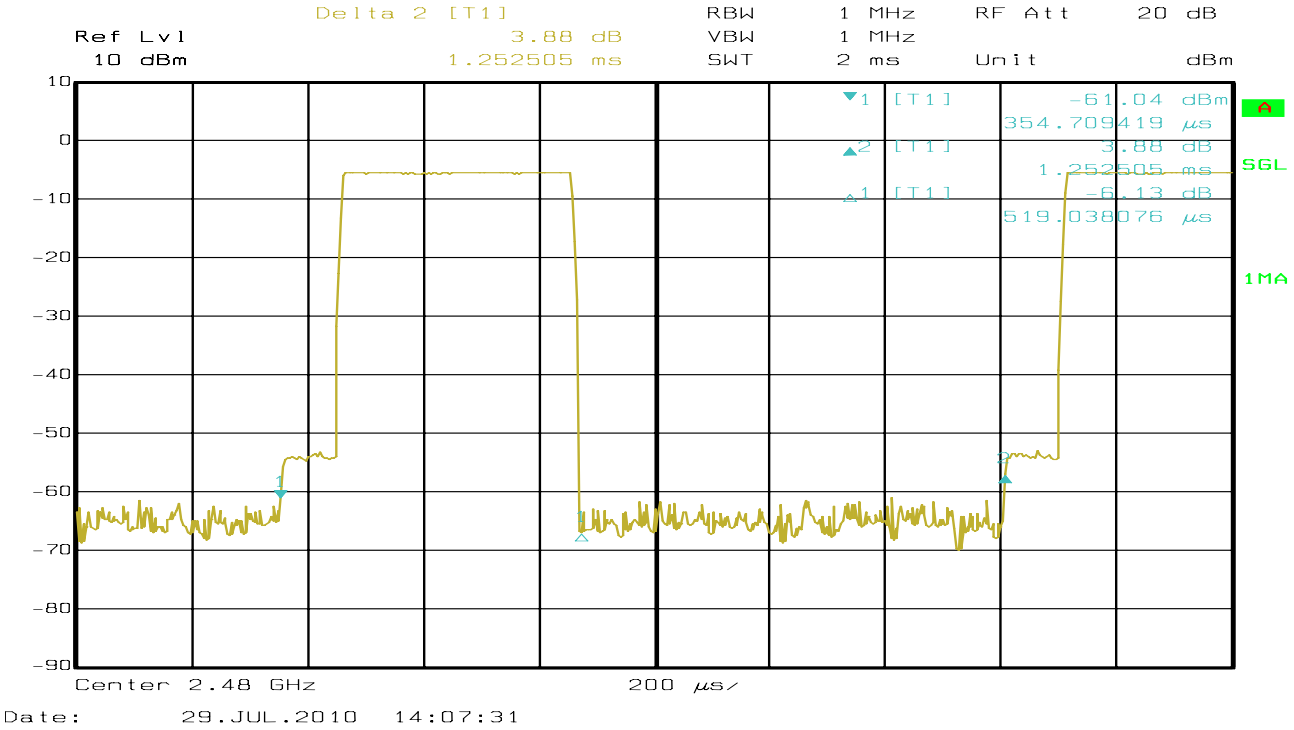
Low Channel: DH1



Middle Channel: DH1

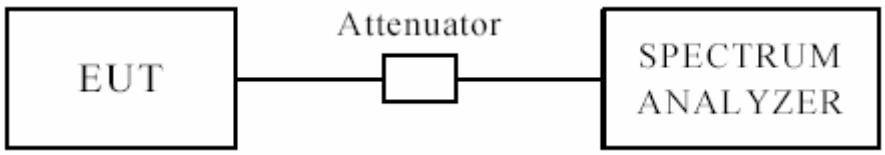


High Channel: DH1:



12 Out of Band Measurement

12.1 Test Setup



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

12.2 Limits of Out of Band Emissions Measurement

1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

12.3 Test Procedure

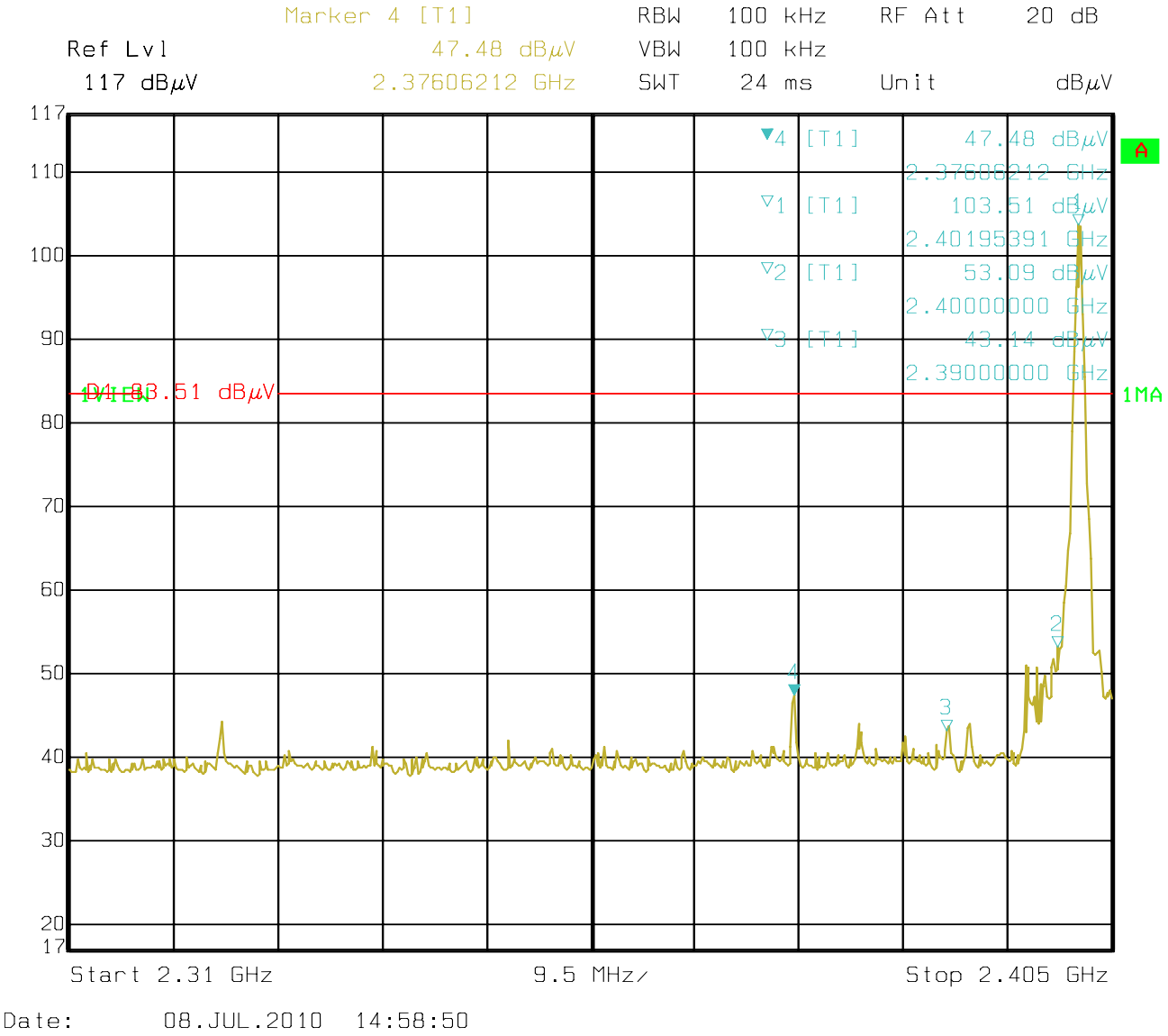
For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test. (Peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector)

For bandage test, the spectrum set as follows: RBW=VBW=100 kHz. A conducted measurement used

12.4 Out of Band Test Result

Product:	NOTE BOOK		Test Mode:	Low Channel
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2376.1MHz	PK (dBμV/m)	52.3	Limit	74(dBμV/m)
	AV(dBμV/m)	38.9		54(dBμV/m)

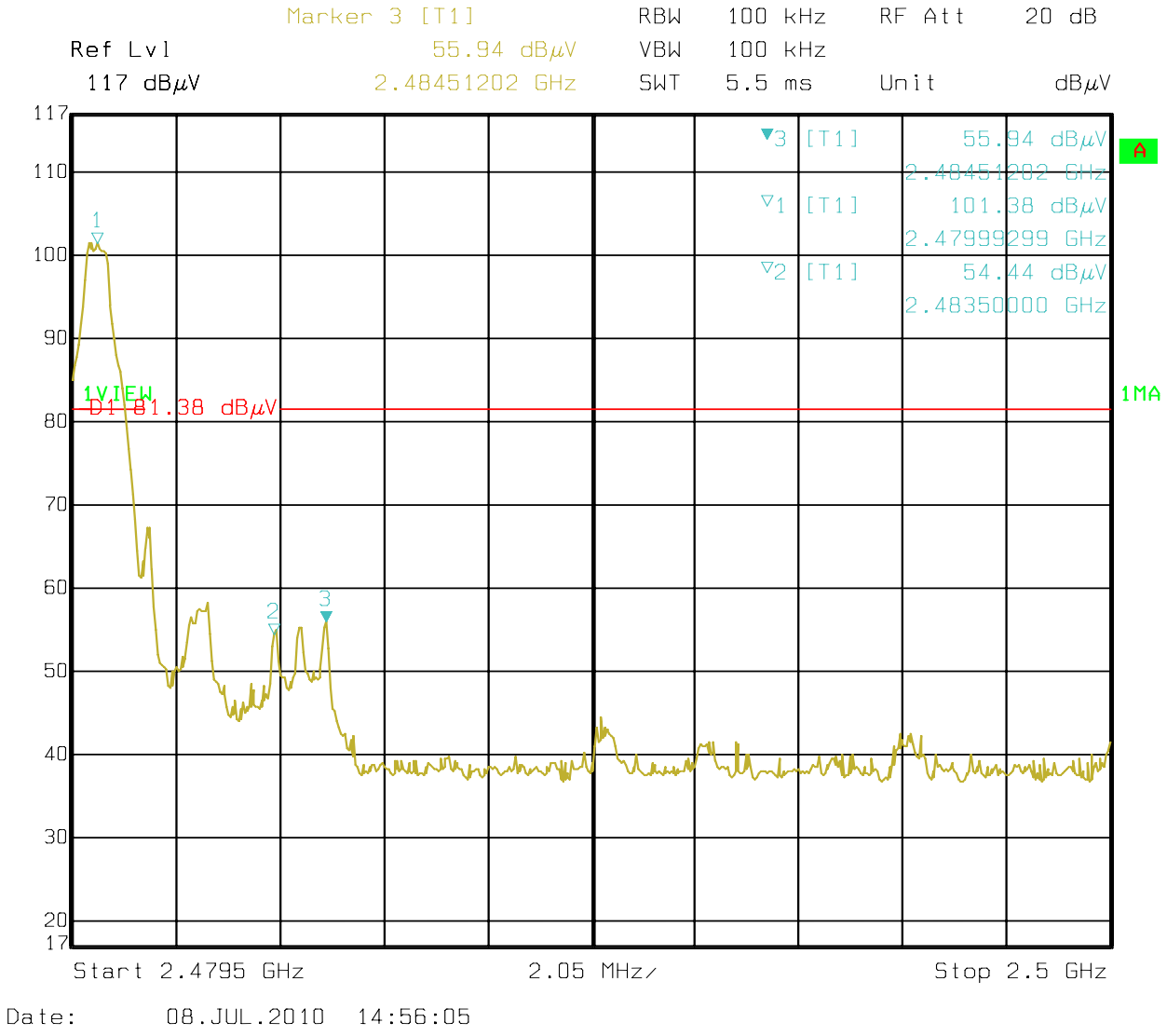
Test Figure:



12.4 Out of Band Test Result

Product:	NOTE BOOK		Test Mode:	High Channel
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2484.5MHz	PK (dBμV/m)	59.1	Limit	74(dBμV/m)
	AV(dBμV/m)	45.6		54(dBμV/m)

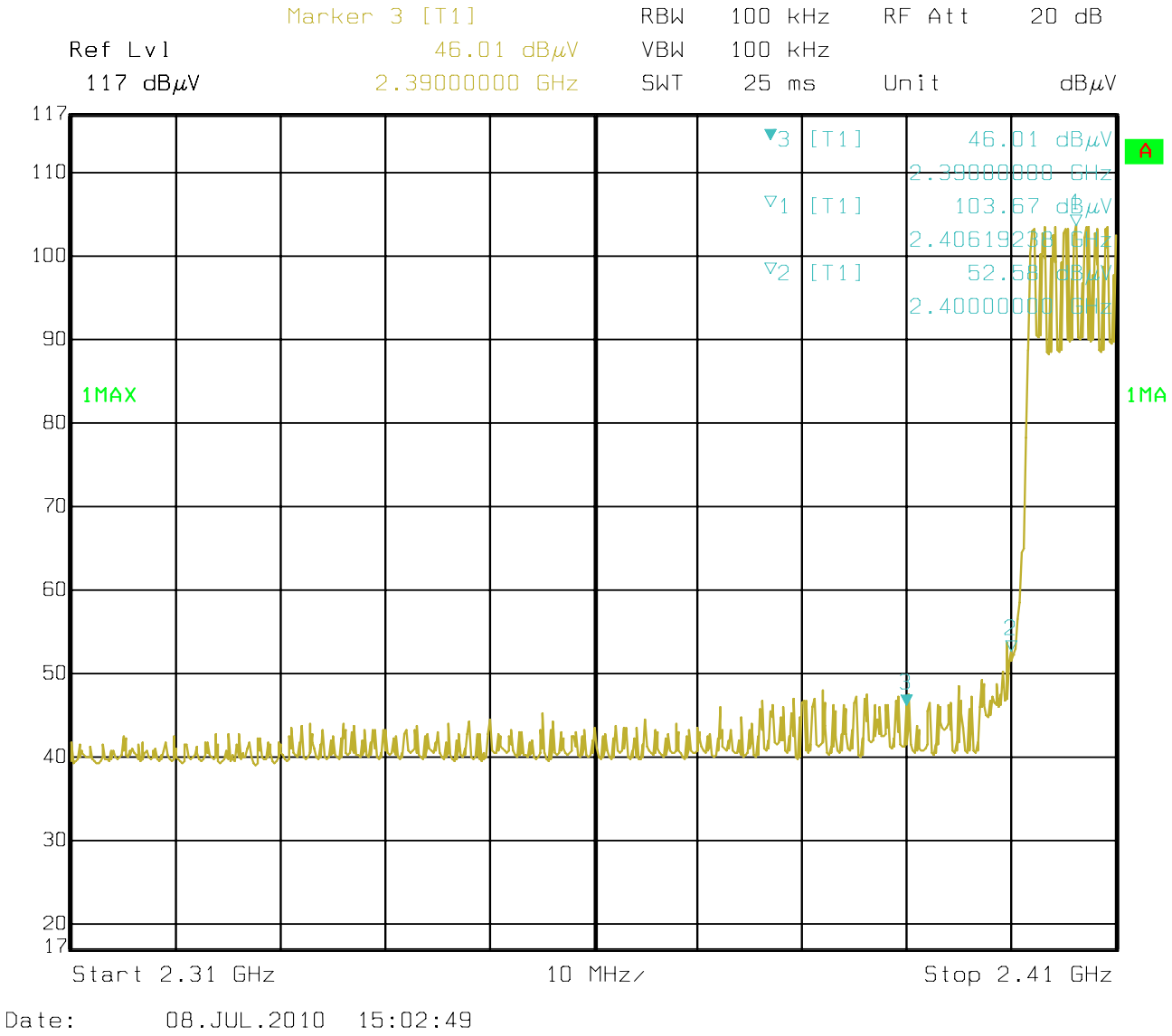
Test Figure:



12.4 Out of Band Test Result

Product:	NOTE BOOK		Test Mode:	High Channel
Mode	Keeping Hopping		Input Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dBμV/m)	48.3	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

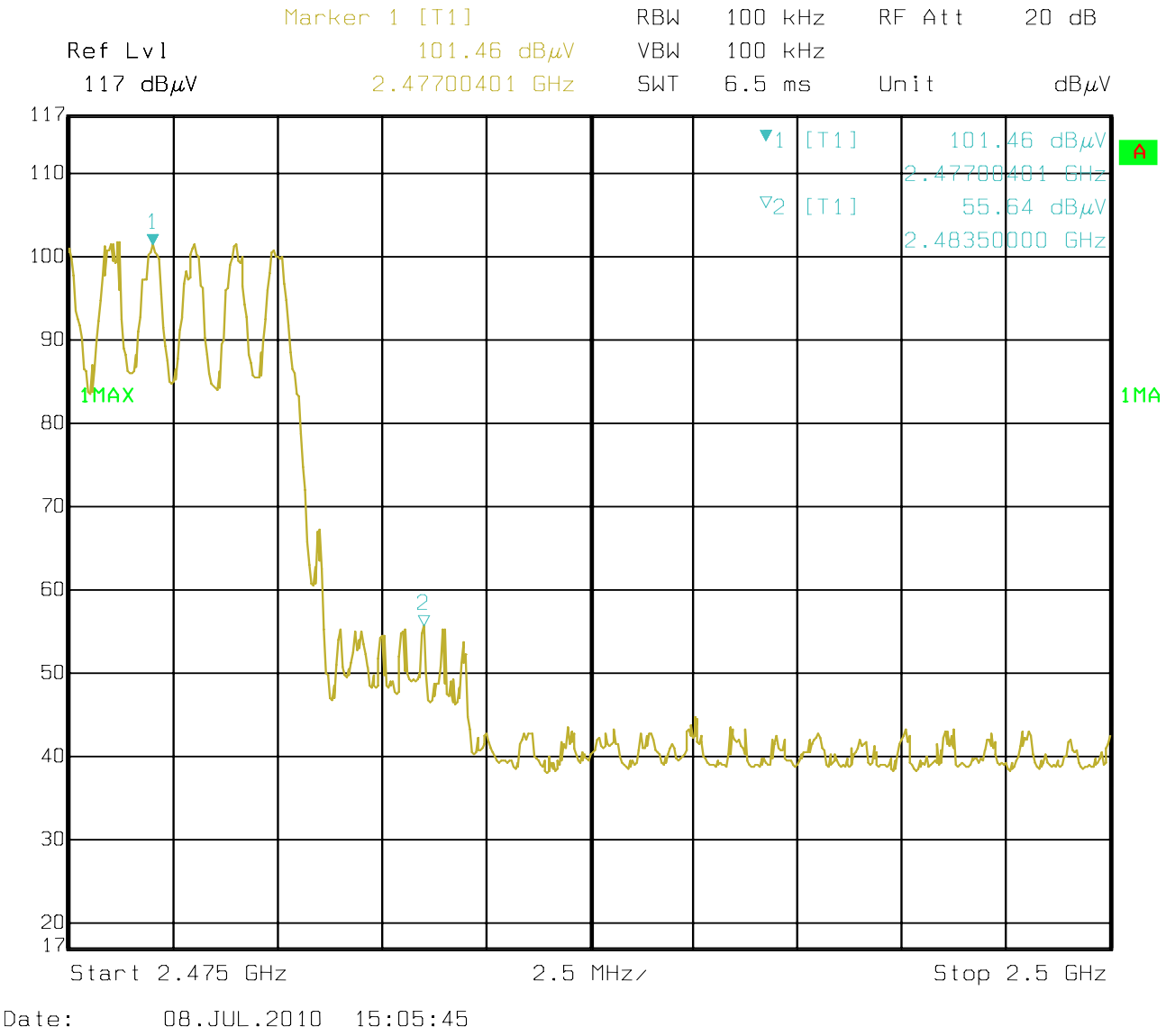
Test Figure:



12.4 Out of Band Test Result

Product:	NOTE BOOK		Test Mode:	High Channel
Mode	Keeping Hopping		Input Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dBμV/m)	58.7	Limit	74(dBμV/m)
	AV(dBμV/m)	42.2		54(dBμV/m)

Test Figure:



13.0 Antenna Requirement

13.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

13.2 Antenna Connected construction

Ceramic chip antenna. The maximum Gain is 5.79dBi.

14.0 Maximum Permissible Exposure

Applicable Standard

According to §1.1307(b)(5), systems operating under the provisions of this section shall be oper-ated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline. This is a Portable device. **KDB616217 was used as the guidance.**
According to §1.1310 and §2.1093 RF exposure is calculated.

Measurement Result

This is a laptop and the conducted output power is -2.91dBm (0.512mW)，which is lower than low threshold 60/fGHz mW (60/2.462GHz= 24.37 mW), and the antenna is 5.5dBi which is less than 6dBi.

The SAR measurement is not necessary.

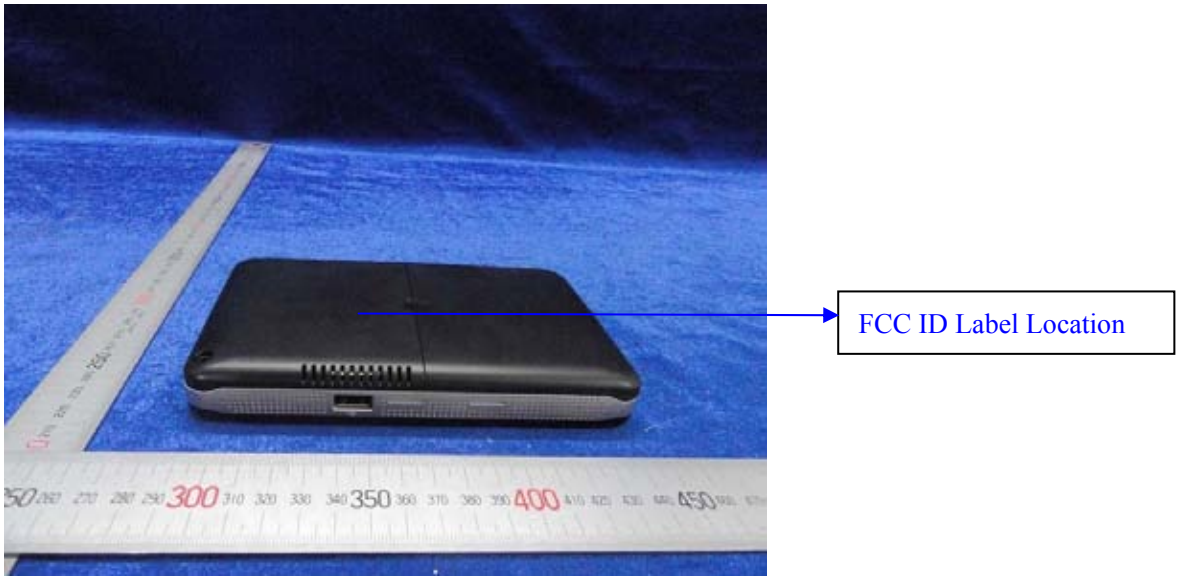
15.0 FCC ID Label

FCC ID: YG6M5A

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

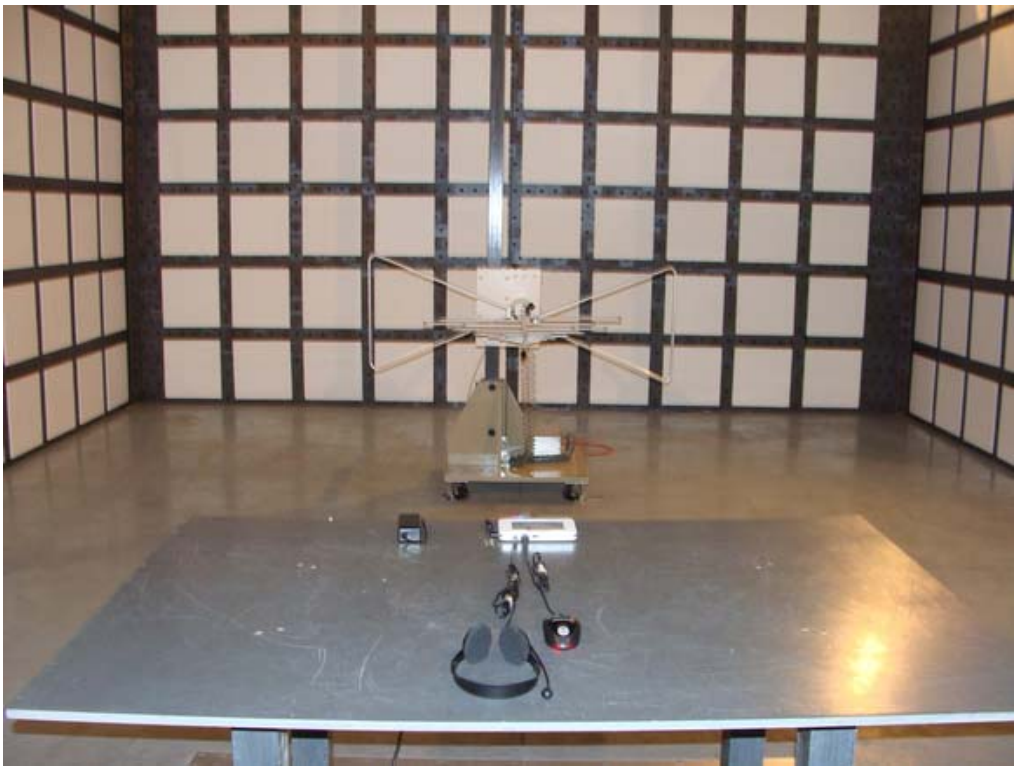
Mark Location:

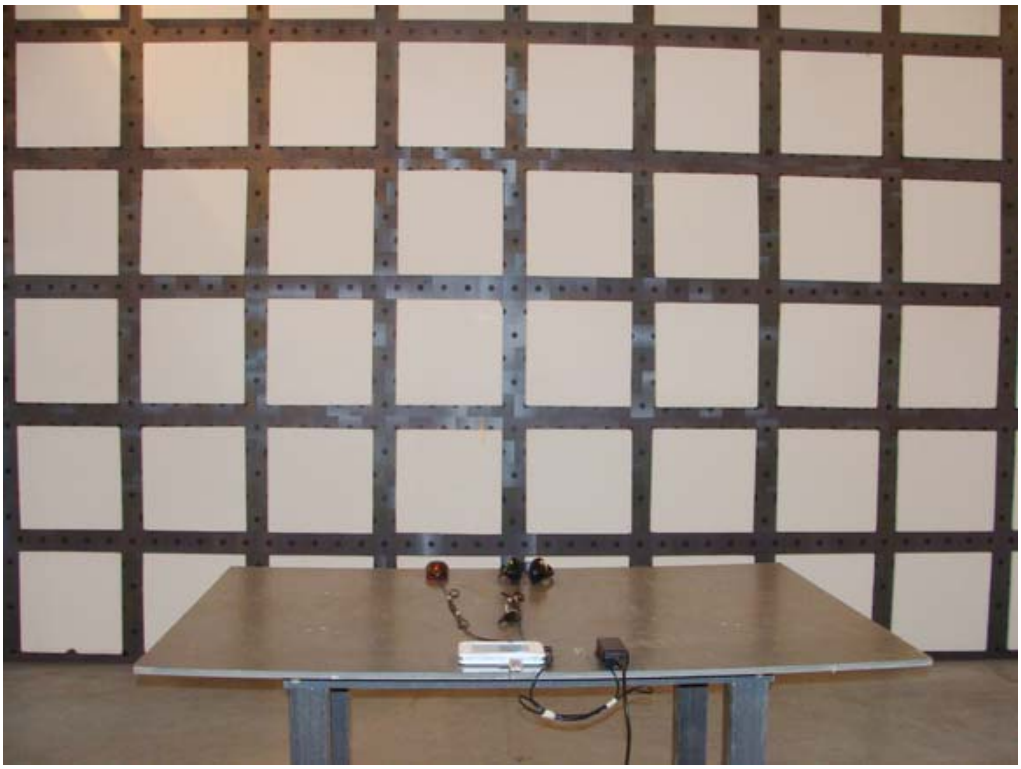


16.0 Photo of testing

16.1 Conducted test View

16.2 Emission Radiated test View





16.3 Photo for the EUT

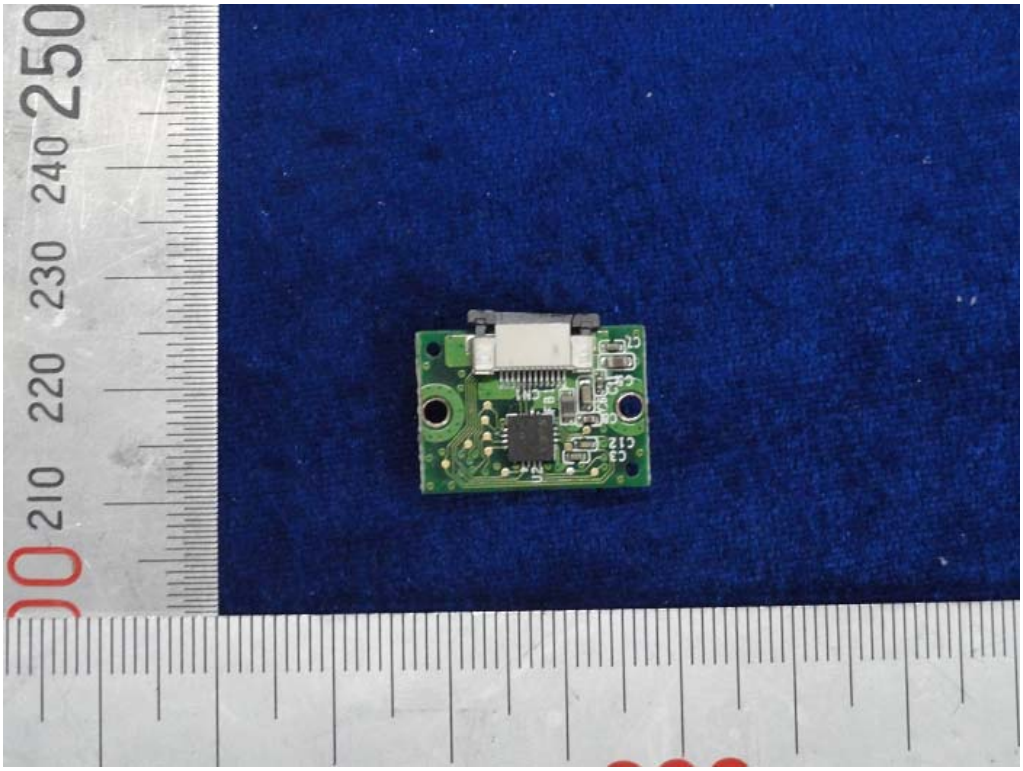
Top of the EUT

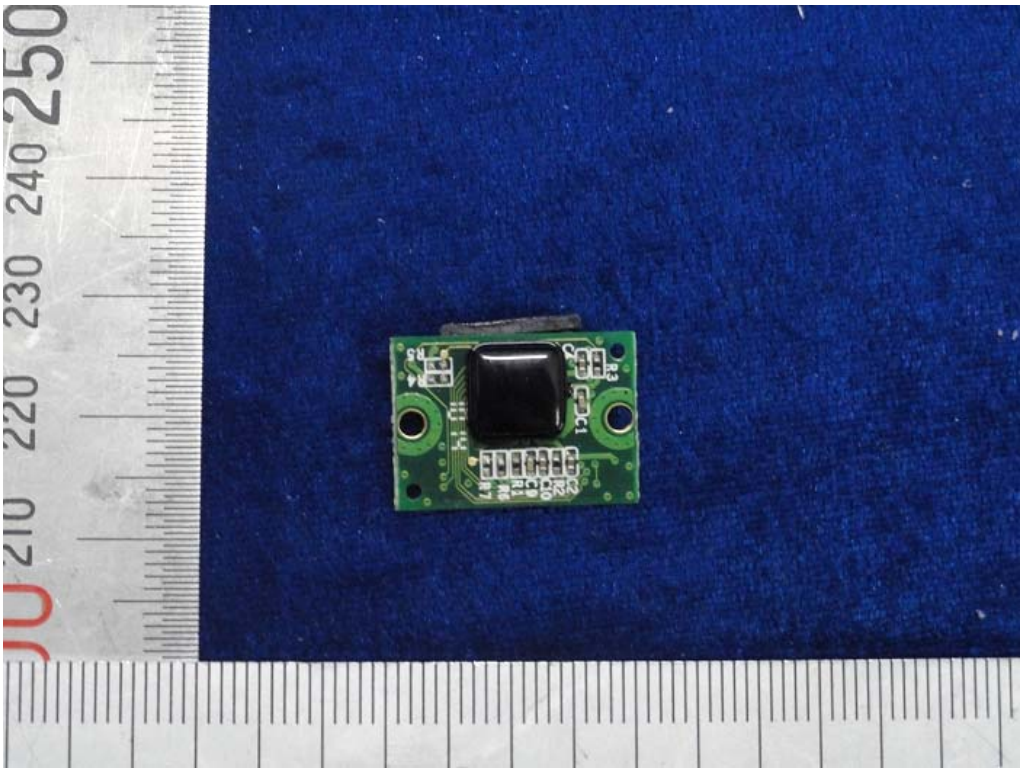
Outside view of the PC

Inside view of the PC

Inside view of the PC

Inside view of the PC





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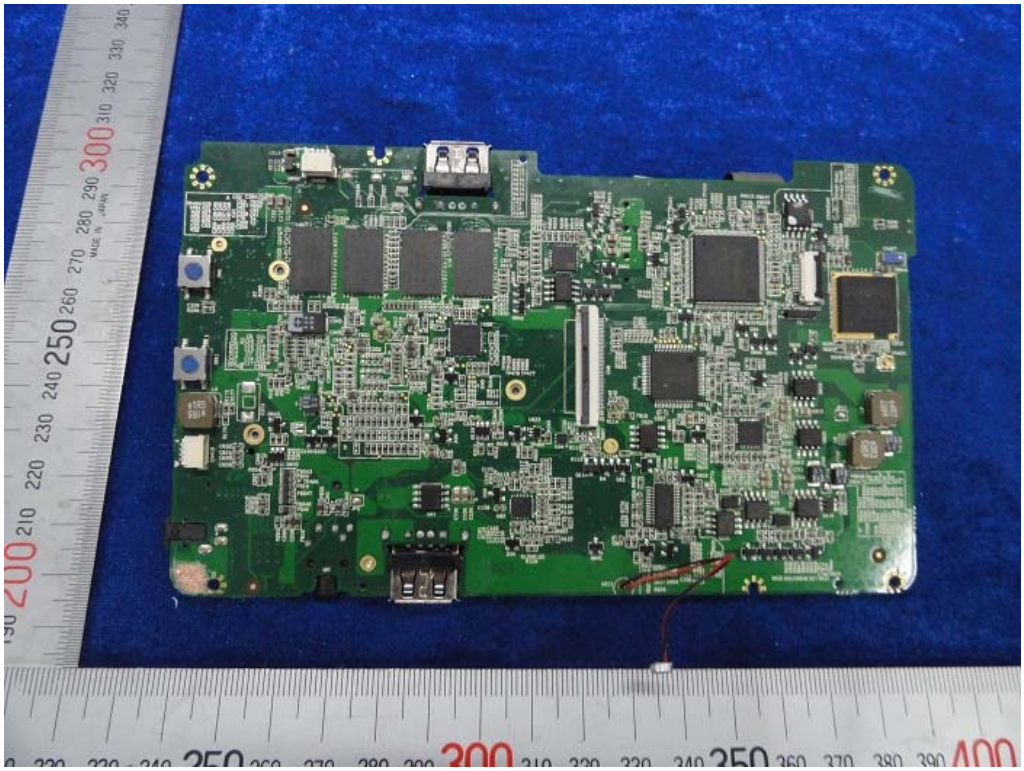
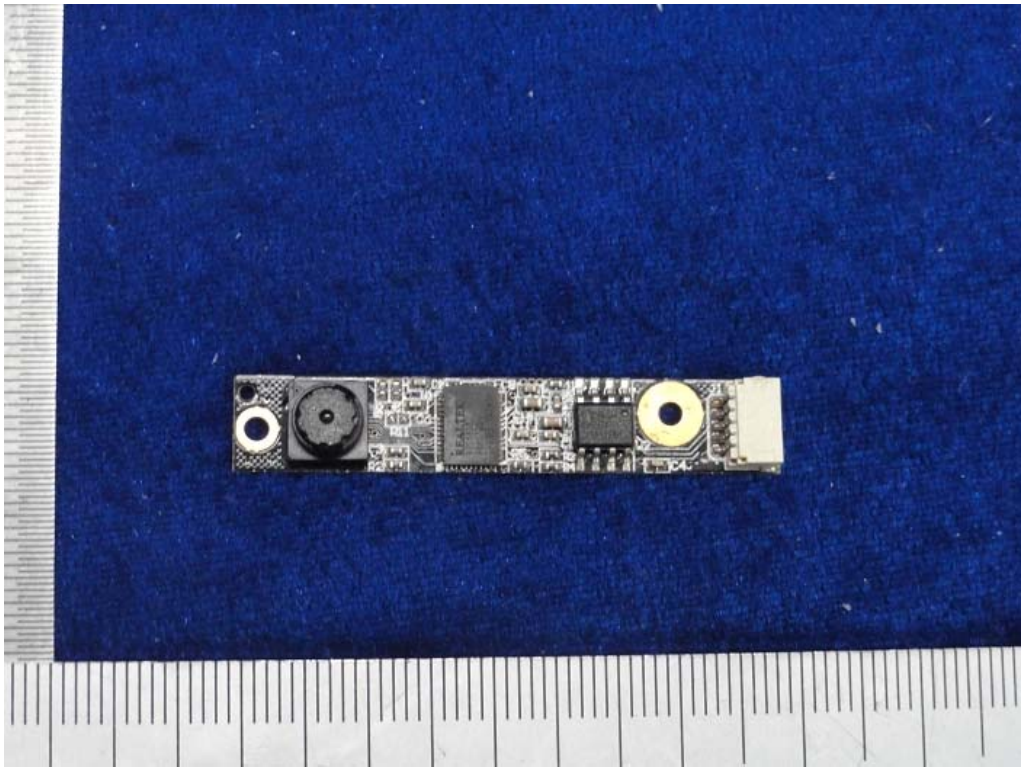
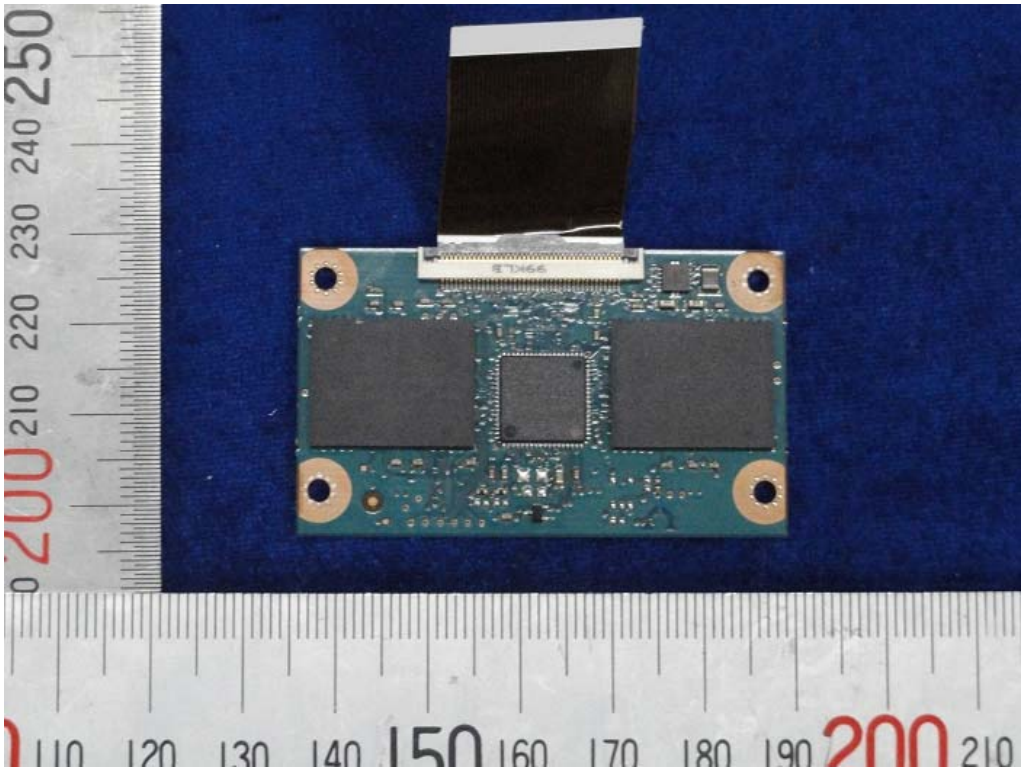
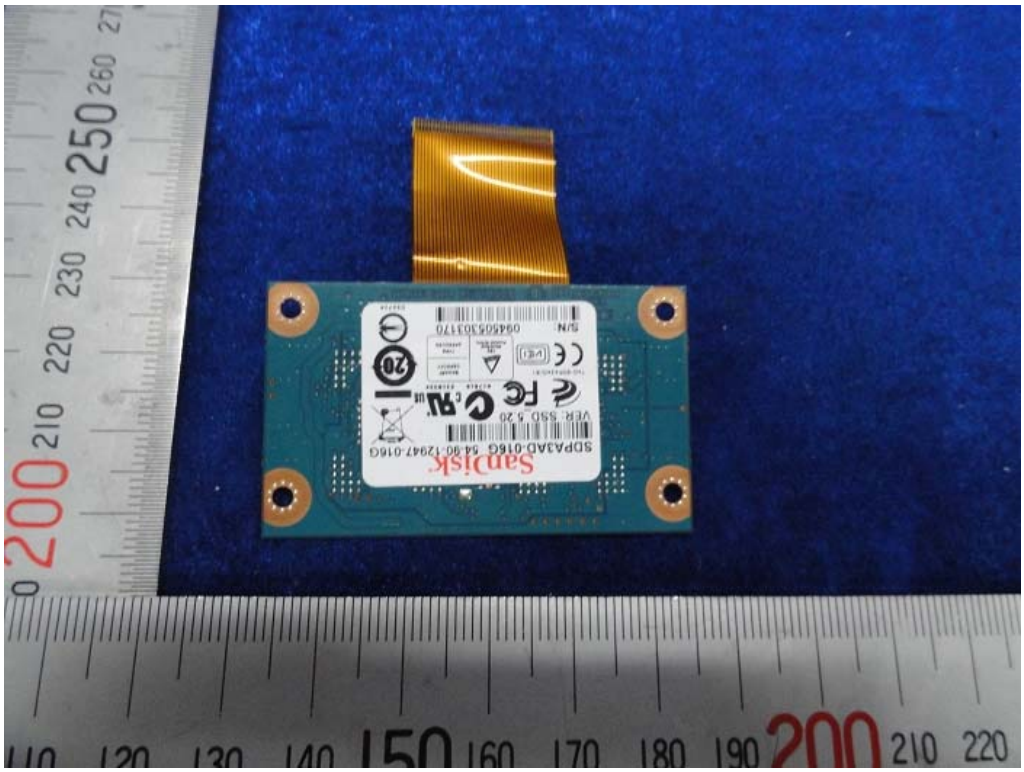


Inside view of the PC



Inside view of the PC





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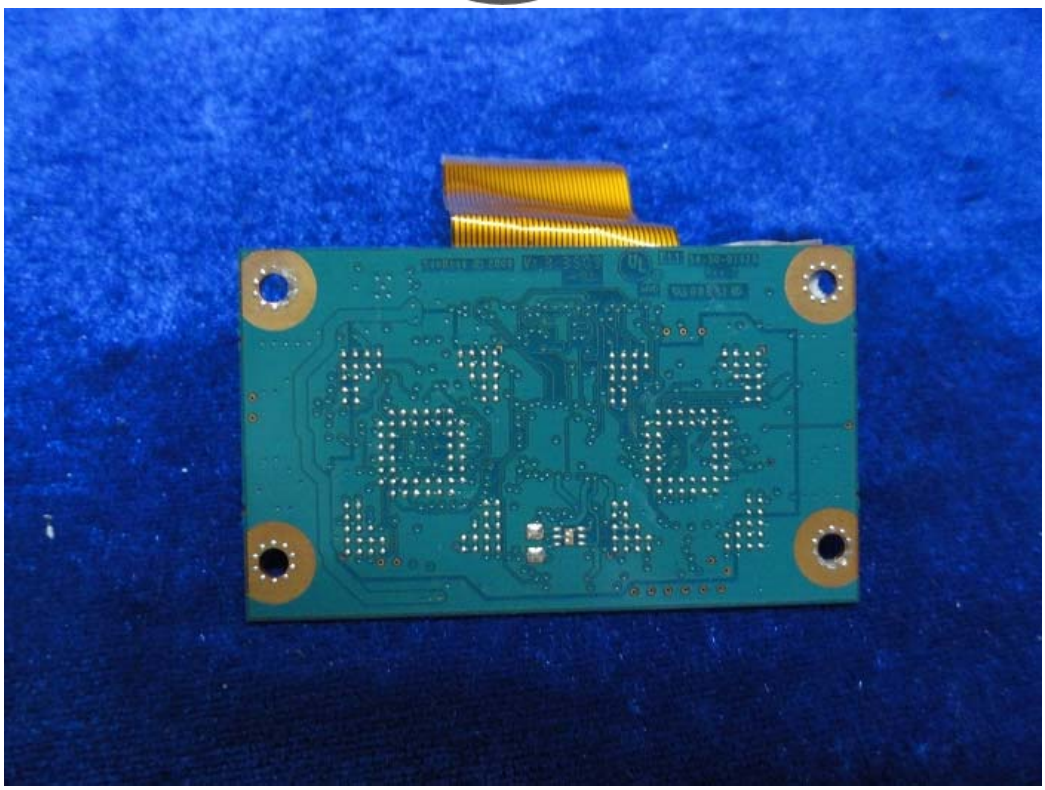

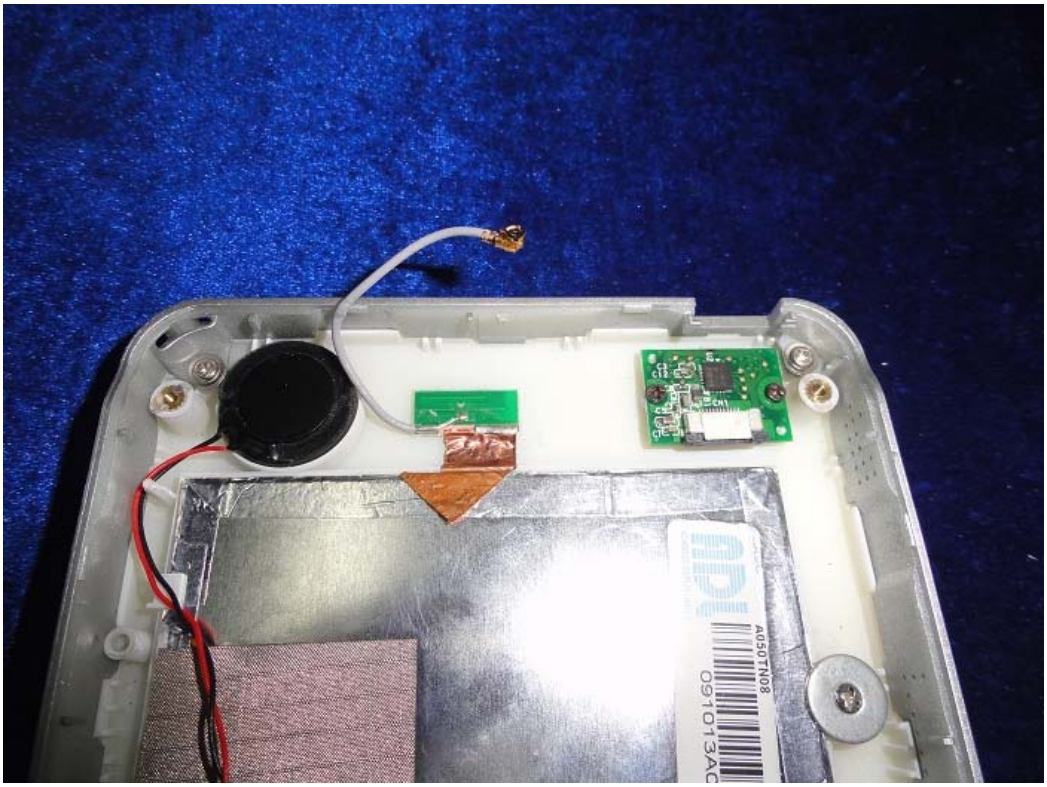

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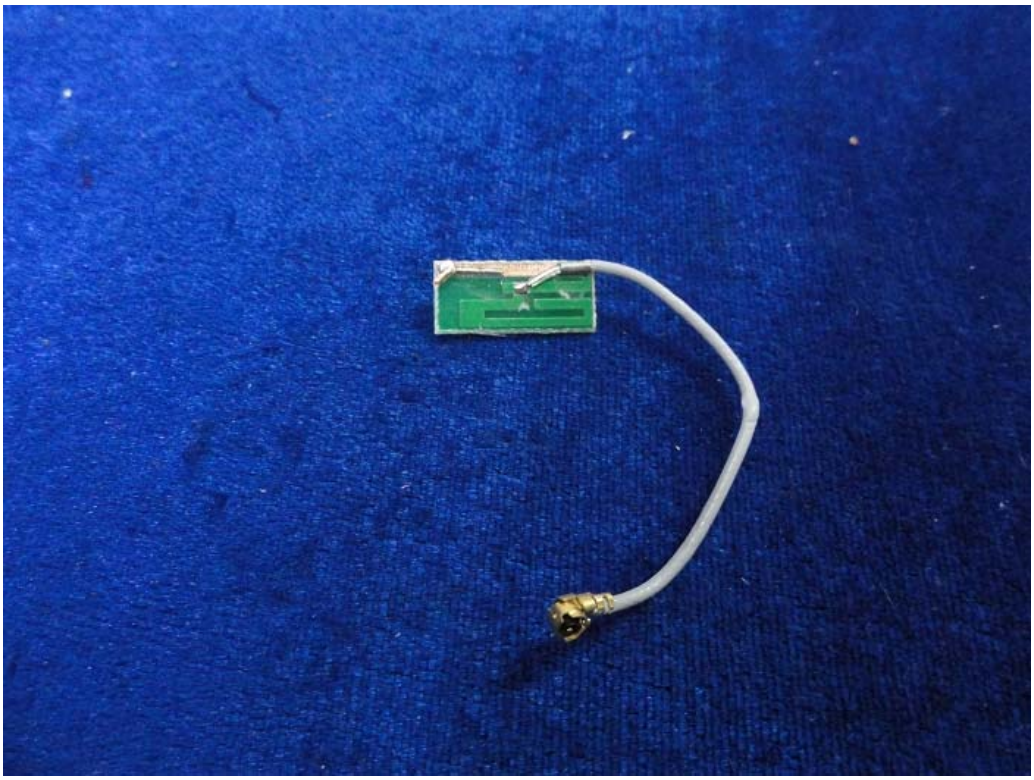

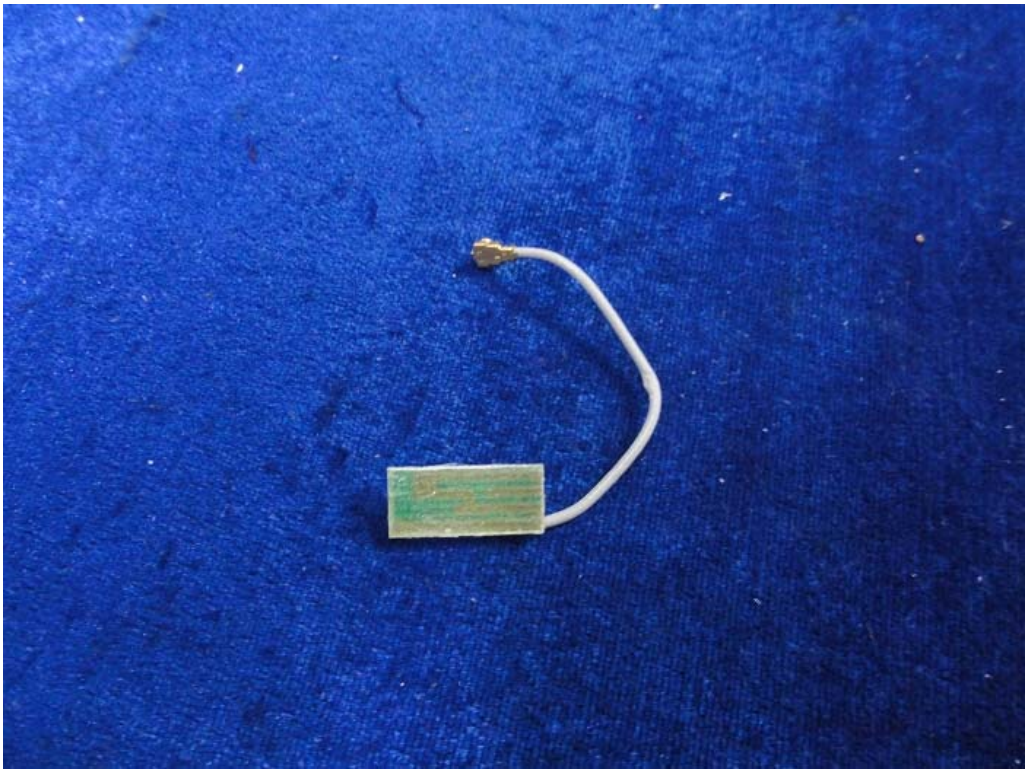

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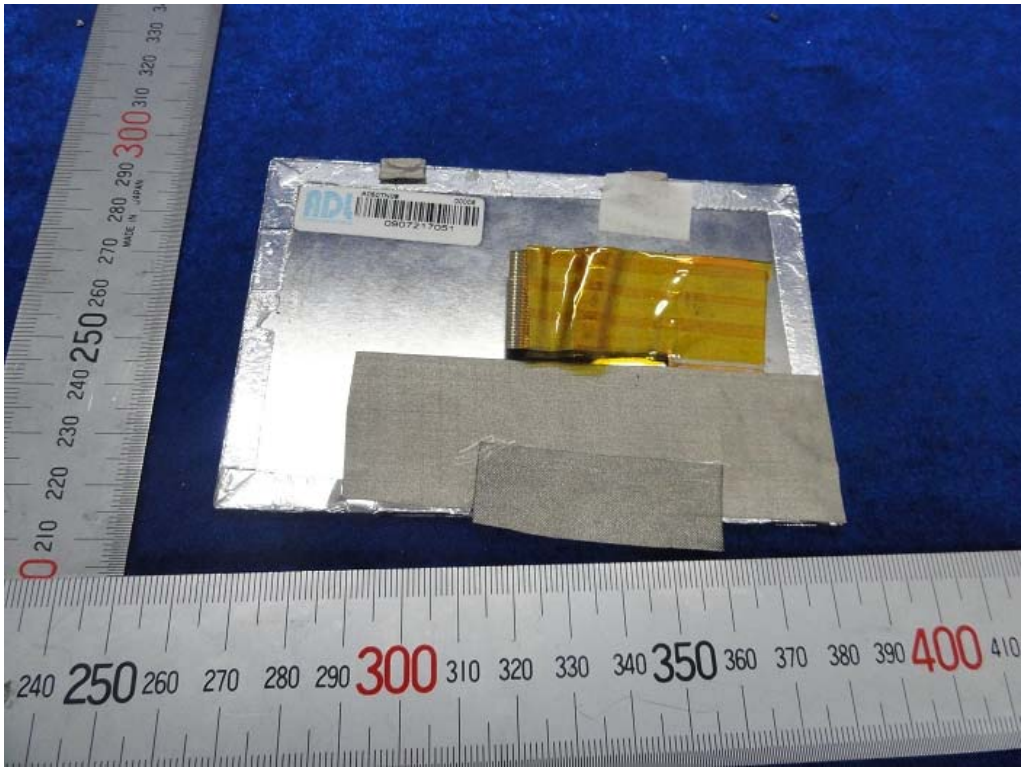

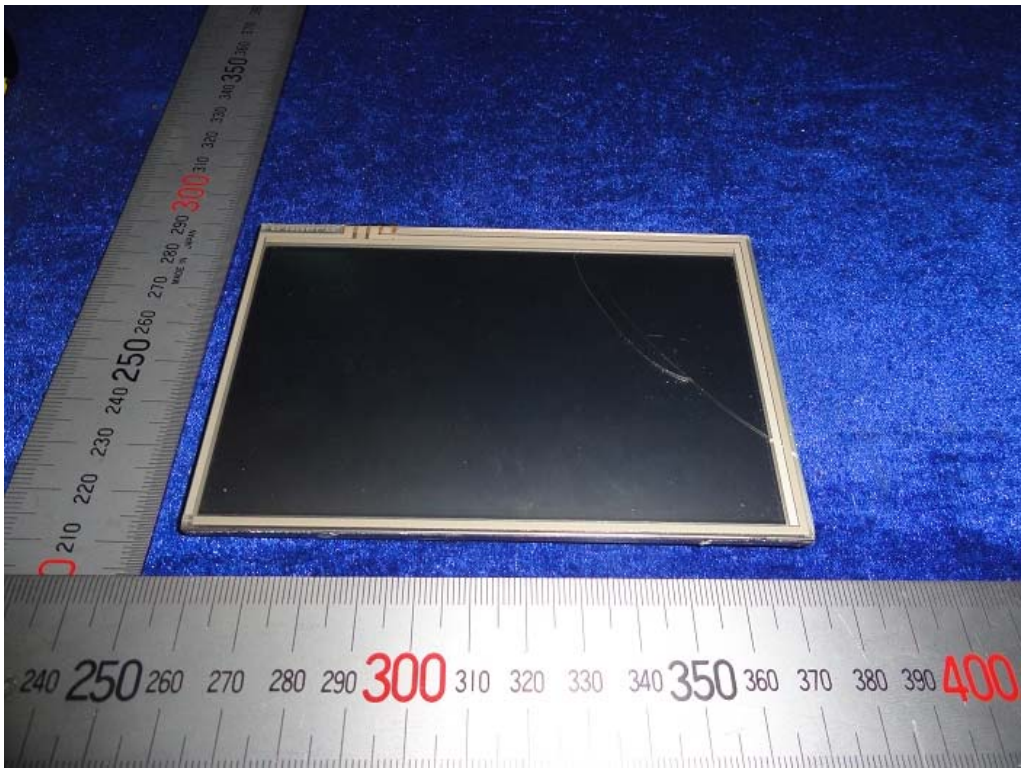

End of the report